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NEWS IN BRIEF

Unions fight
ICL closure

UNIONS fighting the proposed closure of ICL's factory at Dukinfield (CW, November 29, 1979) with an expected loss of over 800 jobs, presented a report to the company this week outlining their alternative proposals and questioning the whole of ICL's corporate strategy.

ICL has confirmed that as its factory redundancy notices to workers are now back in force after a 28-day suspension was granted before Christmas.

Consultancy

A FORMER director of the financially ailing Gamma Associates, Bernie Green, who left late last year (CW, November 28) has set up his own consultancy in Nottingham. Called U.D. Green & Co. it offers what it describes as impartial and unbiased advice in the application of computing.

Motorway system

A NEW prototype motorway signalling system has been ordered by the Department of Transport from Girding and Partners of Stonehouse, Glos. It is to be evaluated at the Almondsbury Control Centre, it uses 8x11 inch display panels displaying LED displays. These can be individually addressed for identification and control by a fibre-optic based light sensitive 'pen'.

Council drops ICL

CONVENTRY Corporation is switching from its eight-year-old ICL System 4 from IBM 3031. The IBM system will be delivered later this year and will be chosen in preference to ICL's tender for a 1972.

COMPUTER WEEKLY

Leasing loss forces Lloyd's to double deposit

THE total estimated \$340 million loss from computer leasing policies faced by syndicates at Lloyd's of London is one of the reasons why Lloyd's members are being instructed to increase from 25% to 50% the proportion of their 'show of wealth' that they have to deposit to ensure that claims can be covered.

Each member's 'show of wealth' is probably not his total personal wealth, but it determines the overall value of all the risks he can take on. The total must be no more than twice his 'show of wealth'.

The \$340 million estimate is more than \$100 million greater than the first loss estimate made for Lloyd's year ago. The new estimate was calculated by the First National Bank of Boston, the organisation appointed by Lloyd's last year to administer the payment of the \$5,000 or so individual

claims being made under the now famous 'J' policies that cover the residual values of IBM miniframes on third party operating leases. Most of the lessors involved are based in the US.

ICL, which took out about a third of all the policies by value, alone expects to put in claims totalling \$200 million (CW, December 13, 1979), so the total claims on Lloyd's could be a lot higher than \$340 million.

Datapoint challenge
for office of future

A COMBINED data processing and word processing system that communicates and also carries both data and voice in the same lines has been introduced by Datapoint under the name of 'Office of the Future'.

Called the Integrated Electronic Office, Datapoint's system is a serious challenge to the other firms such as Xerox, Plessey, IBM and Nexos whose complete office systems are still only on the drawing board.

The new product is based on Datapoint's Attached Resource Computer system which provides a range of functions to individual model 1300 terminals on desks through a network connecting terminals, discs and so on. Available in the new system are message handling and

switching, filing, word processing, data processing, electronic mail and 'mailbox', and automatic control of voice switching.

Store-and-forward voice is not yet available but is under development. The Integrated Electronic Office is already being marketed in the US and is due to be launched by Datapoint's UK agents, Venetec, in February.

The electronic mail facility can send messages either to other terminals on the same site or to remote computers using the public switched network. The Long Distance Control System, as it is called, dials the distant machine and sends the message, all automatically. Received messages wait in an 'in basket' until the user wants

to read them. Voice calls are also controlled by this 'Inflow' equipment which can select least-cost routes automatically. Word processing files are held on centralised hard discs that incorporate a Common File Processor.

A major significance of the product, in Datapoint's view, is that so many different functions are available on the same terminal. DP facilities include Cobol, Basic, and RPG, and information retrieval software is also incorporated.

Both Plessey and Nexos are emphatic about the importance of voice in the complete office system, and Datapoint's head-start into the market with voice facilities, however rudimentary they be, must increase the problems of the other firms.

US interface battle
hots up

THE battle against the US Commerce Department's proposed adoption of the IBM 360/370 channel interface as its input-output standard for its miniframes acquired by the US government continues.

The implementation of the standard has been put back to June 23 this year. In a joint action Honeywell, Burroughs, Control Data and Univac are seeking a court order to block the implementation. The companies say that the

standard is a retrograde step and that if they did not implement it they would be barred from competing for what is an estimated annual market of \$4,700 million.

The Commerce Department has denied this, saying that at least two of the four firms already have channel interface adapters which would enable their miniframes to meet the standard.

Principal objection to the standard is that the request acknowledge-byte transfer protocol of the IBM channel imposes an overhead which would effectively limit data

transfer rates to about 1.5 megabytes per second. This would mean that the government would be unable to take advantage of new technology which will be able to accept and deliver data much faster.

In a paper commenting on the possible effects of the standard, Advanced Computer Techniques of New York forecast that by imposing an unfair high cost and performance penalty on the non-IBM or plug-compatible suppliers in what is already a low profit market, imposition of the standard would tend to reduce competition and put up prices.

Chip technology breakthrough

From front page

Josephson based circuitry in future machines, while ICL with its Distributed Array Processor simply said that it was 'keeping a watching brief' on these new technologies.

ICL said that its own in-house device development was confined to silicon technology. Univac has been working on GaAs device development for some time, although last year the company's former director of research and technical plan-

ning, Dr Barry Borgeson, told Computer Weekly that Univac might end up buying in GaAs devices from Rockwell (CW, May 31, 1979).

Fujitsu is also understood to have done considerable research on these devices. Meanwhile, Rockwell itself sees ultra high speed data transmission as the first major application area for its GaAs devices, although the company envisages the announcement of its first GaAs products as being more than a year away.



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Impact of
computers
on school
curriculum

A THREE-YEAR study is being carried out in Yorkshire and Humberside on the impact of new technology on the school curriculum, under a £60,000 grant from the Department of Education and Science.

The researchers, from York University's education department, aim to gather together and explore the ideas that are coming out of schools and make them transferable to others.

General education rather than specialist is the concern of the study, and computer awareness will be a major part, although not all of it. Basic information, for instance, which every child will be made available.

One school is interested in linking computer awareness with other forms of study, such as 'thinking' training as devised by Edward de Bono. Elements of computer programming are being added to this. There is a sixth-form college which is planning to add computer appreciation to its course on the broader issues of technology, involving decision-making on technological change, social power and the like.

Briefing

Systems for
UK from Japan

A RANGE of small business systems from Japan has been introduced in the UK by the electronics giant Matsushita. The systems run a suite of business programs developed by CAP-PP using its Microcobol. There are four models, each with 64K of memory and built-in twin floppy discs. They cost between £6,000 and £9,000.

The machines will be sold under the Panasonic name through UK distributors. This is the first time the systems have been available outside Japan.

Chairman quits

SIR Robert Clayton has resigned as chairman of new semiconductor company GEC-Fairchild, rival to the NEB's Immos, to remove the embarrassment of potential clash of interests following his appointment to the board of the National Enterprise Board.

Jaime steps up

COMPUTER Weekly's chess-playing protégé, 12-year-old Jaime Gorman, will be one of 25 under-18s playing international grand master Larry Christiansen simultaneously this Saturday. The honour of playing was one of the prizes in the London Evening Standard Junior Tournament, in which Jaime came third out of 100 players in the under-14 group.

Byte Shop bidders

THERE are two leading contenders for the purchase of the troubled Byte Shop, one of six retail computer stores. One is Comart (CW January 10), and the other is understood to be Currys. Comart's existing dealers are watching the situation closely. Digitus summed up one view by saying, 'Obviously it is a potentially compromising situation if Comart moves into retailing with the Byte Shop. But our source of supply have been assured by Comart. They are a good company to work with.'

Nexos fax launch

NEXOS has launched its first product that is new to the UK market: a facsimile transceiver compatible with the CCITT standard for three-minute transmission of an A4 page, and an option to transmit it in less than one minute. With engineering support from facsimile specialists Mithras, Nexos aims to secure a major slice of the European market. Full details, page five.

100m chips a month

THE £45 million being invested by National Semiconductor in its Grange Park, Scotland, facility (CW, July 28, 1979) will make it one of the most productive in the world. It will be one of the first to use silicon wafers of five inches diameter, and should be able to produce about 100 million chips a month.

Where will the Oozlum go in the Eighties?

FUNDAMENTAL changes will hit the computing profession as soon as technological and commercial limits are reached, and those on the inside need to look at the ideas coming from the outside world to be able to adapt.

That was the view put forward by Iann Barron, managing director of Immos, in this year's British Computer Society annual lecture.

Barron entitled his talk The Oozlum Computer, from the bird that goes round in ever-decreasing circles. He pointed out that the falling costs of integrated circuits would soon start to level off and then rise as increasing complexity and manufacturing limitations took over from the economies of scale in ICs.

There was no point in increasing the number of devices on a chip indefinitely, he said, suggesting that 80% of the market now would be satisfied by presently available complexity.

Computing had been restrained for too long by the serial view of processing imposed by von Neumann's original design, Barron said, but the momentum on development was now outside the industry, among the millions of hobbyists and users' programmers who were interested solely in processing information, not in the technicalities of computing. These people needed languages geared to simultaneous processing, and to provide these we must re-orient the way we think about languages and not just bolt on new

features, as with Ada.

Companies were mistakenly trying to preserve the capabilities they have by increasing power and complexity and are thus producing technologies that are not at all suitable for these real applications, Barron insisted. He gave as examples, the bipolar and Josephson junction work that IBM is doing. Instead, Barron said, we need to re-evaluate a lot of our ideas about computing to establish which are fundamental and what ideas from outside are going to affect our path.

'Our skills are transient,' Barron said, suggesting that the BCS look to the future so that we could adapt rapidly to the changes soon to come.



Barron

ICL committed
to big systems

ICL is fully committed to the large systems business and its VME operating systems are here to stay. A statement on Monday from communications director Alan Benjamin in response to Computer Weekly (CW, January 10) should quell the rumours that have surrounded ICL's plans. And it suggests that ICL

is planning a 'super 2900' offering five times the power of the 2982, currently its top machine, with a launch pencilled in for 1984.

'In response to your editorial,' Benjamin told Computer Weekly, 'we welcome the opportunity to make a clear statement about our large system plans.'

Now SPL falls out
with Insac Products

THE National Enterprise Board's shareholding in SPL International looks like being sold to commercial interests in the next two months. SPL is understood to have bidders lined up that could adequately take over the fund-providing role of the NEB and also put a lot of new business SPL's way.

SPL chairman Peter Adama has already expressed his dissatisfaction with Insac Products, the NEB enterprise that handles export marketing of its members' software (CW, December 13, 1979).

Last week Adama realigned from the Insac Products board without appointing a successor. SPL marketing director Don Wilson will liaise with Insac Products, but will not join the board.

Under its agreement with SPL the NEB must make its shares available to bidders of SPL's choice if it wishes to sell its SPL holding, and the NEB is unlikely to refuse a reasonable offer in view of the Conservative government's long-term commitment to cutting down the activities of the NEB.

The NEB's holding in SPL was acquired just over two years ago. It consists of 80% of the dividend bearing non-voting shares of Systems Programming Holdings, which owns SPL, and 30% of the SPL voting shares.

The remaining 20% of non-voting and 70% of voting shares are held by NDC Systems SA, the Geneva-based associate company of the National Datacentre Corp. NDC, one of the largest bureau and computer services companies in Canada, SPL itself has confirmed that it wants the NEB to sell its holding but is not yet prepared to reveal the identity of the prospective purchasers that have

been lined up to buy the shares.

Meanwhile another major software house part owned by the NEB, Logica, is to discuss at its next board meeting at the end of January whether or not to appoint a new director for the Insac Products board. Logica managing director, Len Taylor, resigned from the Insac Products board before Christmas.

Schools' robot
competition

A COMPETITION for schoolchildren on the theme of 'The robots are coming' is being organised by the British Computer Society's computer education group and bureau CMG. Stories, poems, drawings, plays, essays, or technical projects are invited from anyone between five and 19. No special 1st knowledge is expected. Entries must be sent by March 31 to P. Crocker, Croydon College, Fairfield, Croydon, Surrey.

INSIDE THIS WEEK'S CW....

MICRO SYSTEMS
With a new decade just starting, it is only right that new technology in the shape of microprocessors and microsystems should be the subject of the industry's first major annual event. Microsystems 80 opens at the end of this month at the Wembley Conference Centre, and this week we give a preview of what can be seen and heard there.

ALSO...
Computer interview on series to...
Letters to the Editor
UK legs behind
Dewitts by Chad
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Focus on belt-tightening
Nexos in last market
Pete G's programme
Software file
Op Spot
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People and Events
Micro News
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The New Bit
Brief news also

JOB VACANCIES:

PAGES 21-55

How to get started
with microprocessors

BRITAIN'S leading professional microprocessor exhibition and conference, Microsystems 80, is being held at the Wembley Conference Centre from January 30 to February 1. For those who want to know about microcomputers and software but don't know where to start, this event could provide the answer.

For the first time Microsystems will feature three one-day professional development courses designed to introduce the beginner to various aspects of the micro system.

The course on January 30, 'How to get started with microprocessors', is designed as an introduction for managers who must make crucial decisions affecting the development, manufacturing and marketing of products incorporating microprocessors.

A hands-on workshop for engineers entitled 'Microprocessors/Microcomputers' is being held on January 31. This will give participants a practical insight into the basic concepts of microprocessors.

For further information about Microsystems 80 write to Chris Higwell Room 125, Dorset House, Stamford Street, London SE1 8LU or telephone 01 281 8884.

Seicon buys Scan bureau

GSI UK, formerly the CRC Group, has decided to sell its online financial services bureau, Scan, to Seicon Computer Services of Milton Keynes.

Seicon is said to be a suitable buyer for Scan. Scan's services for stockbrokers like portfolio management and investment research complement Seicon's existing financial services.

Seicon, which operates a Univac 1100/81 at Milton Keynes, is a much bigger Univac user than GSI and therefore is in a better position to tackle the rewriting of the Scan software to run on 1100 series machines.

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Chip technology breakthrough

From front page

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COMPUTERVIEW

THE Russian invasion of Afghanistan over Christmas has finally dispersed the mirage of idealism which clouded international politics for much of the 1960s and 1970s.

Suddenly trade boycotts and sanctions against the Soviet Union can be proposed and enacted with almost no dissent.

Has the West been too complacent about the sale of high technology to the Eastern bloc, as persistent Democratic presidential director Senator Henry Jackson believes? Or does the future peace and happiness of the world depend on closer trade and technological links across the political divide, as Control Data's William Norris believes?

Norris' idealism is infectious and inspiring. As few other men have managed to do, he has built a company dedicated to making money which can in part be devoted to helping small countries get on their feet (CWI, January 10), to educating the disadvantaged, to aiding progress in the Third World — and to building trade bridges to the antagonists of the West.

Idealism is an admirable quality in individuals but has never played more than a cosmetic role in international politics. Electors choose governments which offer the brightest prospects for themselves and democratic governments tend to see the greatest good for the

Undesirable dealings?

greatest number simply because a satisfied populace re-elects. In totalitarian countries, where electorates have little say in their future, repression still has to be tempered with recognisable progress if the ruling elite is to survive.

South Africa is a fashionable ogre, not so much because its policies are intrinsically evil (although they are more so), but because black Africa regards South Africa as the supreme pariah among nations — and black Africa's growing wealth can confer economic advantage on the West.

At present the advantages of trading with South Africa, coupled with that country's strategic location in the event that Europe-bound oil tankers cannot navigate the Suez Canal, outweigh the threat of trade sanctions against Britain by emerging African nations.

However, the balance is shifting all the time. Some point the oil in Nigeria and the prospect that it brings, coupled with the minerals in South Africa, may outweigh the advantages which South Africa, at which point a future British government will drop South Africa with scarcely a thought.

Companies like ICL, with big investments in Africa and growing business in black Africa, make their own perceptions of the balance at any point. It may be necessary for ICL to withdraw from the ICL machines which the South African government wants to build will be very costly.

The point is that while individuals and even interest, governments cannot. The answer to the question "should we trade in high technology with South Africa?" is that we should do so when the balance of advantage to us seems to favour it. Perhaps that is again the case in the foreseeable future.

But since each country practices self-interest, the US and the UK in applying embargoes against the Soviet Union may well be assisting the Soviets to set up a computer industry.

LETTERS to the EDITOR

IN his interesting article, Dick Sizer really has a much weaker case than he pretends (CWI, November 28, 1979).

Utilisation rates are an awful red herring. No-one expects company cars to run 24 hours per day; why should minis? The costs in many companies must be comparable. Sizer would presumably make the 10,000 mile per year man drive a car capable of only 2 miles per hour, and plan his journeys very carefully. The extra power of a reasonable car (or of a reasonable mini) costs very little (less than the cost of the planning, or of the operators' overtime), and makes life very much easier.

Now that computing power is so cheap, any sensible installation will provide enough of it that only the lunatic fringe require more, that most users receive instant response, and that the system does not have to devote 0.5% of its own resources to organising itself (as one very highly regarded operating system is reputed to). We handle large numbers of student jobs and our mini is left running 24 hours a day, seven days a week; and is actually in active use for normally about 60 hours a week, the idle time is the (cheap) penalty for having a responsive system, and is available for anyone who wants about 100 hours a week of low priority computing (and I wonder how 100 hours of PDP-11/34 compares with the few minutes per week of CDC 7600 time that our more extravagant users are able to negotiate?)

Sizer may well be right about the financial controls (or lack thereof) involved in the purchase of minis, but his example produces little cost to the company of well over £4 million a year; only very poorly managed companies are likely to be entirely unaware of expenditure at that sort of level. Sizer must be familiar only with some very old mini-computer systems. These days, his "typical amendment" need be typed only once: it will get in the other sites via a communications network or (at worst) by carrying a disc around. If one of our basic executive routines has to be altered, and the system "completely regenerated" it typically takes two or three minutes to recompile the routine and install it in the system library, two minutes to re-link the system kernel, and a minute to shut down the system and bring it up again; scarcely the four hours that Sizer thinks is

Minis offer facilities to compare with mainframes

typical. Of course, some manufacturers' software is like that, but the stuff that people actually use is much better.

Sizer also omits many points in favour of minis. They don't break down as often, because they are much less complex. Our mini has less than 5% of the scheduled maintenance requirements of our central mainframe, and we have perhaps 10% of the system breaks. When a break does occur, we are usually back up much faster.

Mentioning "back up," I wonder what Sizer's back-up arrangements are like? Several hours' notice of a site many miles away? A semi-computing system capable of running only a tiny fraction of the workload? Cross-country dashes with vanloads of tapes and cards and discs (not to mention special stationery)? In our case, there are other totally compatible sites, also running the Unix operating system on PDP-11s, actually on campus; running urgent jobs involve carrying one disc containing the relevant files a few yards.

If it is necessary to move our entire operation, two discs are needed in the first instance, and we can be up and running on any PDP-11/34 or larger with at least two RK05 disc drives and memory management within (literally) a minute of arriving at the new host machine — yes, we have really done it.

Sizer's cost comparisons are based on 100 largish minis. Our more modest system costs much less than half his, and supports a

user community of about 40 (three experienced computing scientists, seven or eight research students, a few experienced users, half an administrative assistant; the remainder mostly fairly naive). A typical acceptable workload is five users simultaneously online going through a think-edit-complex-run-think-edit cycle (unless all five are compiling together).

Sizer's mini could presumably support easily twice this, and his 100 minis would therefore be intended for an organisation with 5,000 active users of whom 1,000 might be expected to be online and getting instantaneous responses during peak periods.

Perhaps his mainframe can cope with similar figures — if not, his comparison is spurious — but I know that our central mainframe is overloaded with a few hundred users, and staggers a bit if 40 of them are online (even though they are only supposed to edit and submit jobs, not actually to run them).

The truth is that minis these days provide facilities which are at least comparable with (and in many cases superior to) those on mainframes, and they have a reasonable fraction of the power, at a small fraction of the cost; they are much more flexible and much more enjoyable to use locally rather than centrally, and they are much more cost effective for what they do than central mainframes.

This is not to deny the essential rôle played by central facil-

ities. In our case, if our computing centre did not have fast line printers, tape decks (thorough), card readers, archiving and retrieving facilities, advisory services, engineers, graph plotters, and bulk facilities of all types, to name but a few, all on acceptable cost, we would need to provide these things ourselves at prohibitive cost. In large companies (or research stations or universities), several different types of installation will be necessary, each type carefully planned to serve particular needs as effectively as possible.

Micros? Yes, our mini runs an efficient operating system (Unix), is well documented, provides excellent file management, excellent database, online sales facilities, runs (at the time of writing) 13 high-level languages: Algol 68 and Pascal to a comprehensive but equivalent language, and Lisp a pleasure to use.

When a micro system which has similar advantages to a fraction of the price replaces our mini, just as it replaces our mainframe, a large proportion of our work will be done.

Dr A.N. Nottingham University

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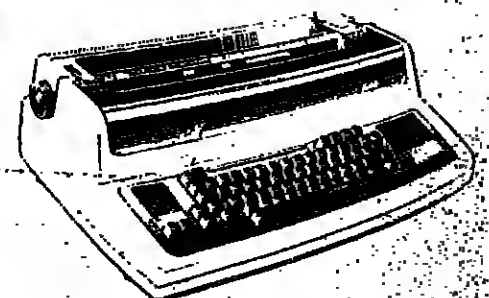
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The following courses will commence week beginning 28th January, 1980:

- S.C.M. 1 - Introduction to Microprocessors (afternoon and evening)
- S.C.M. 2 - Software design for Microprocessors (afternoon and evening)
- S.C.M. 3 - Microprocessors in Control Applications (afternoon)
- S.C.M. 4 - Understanding Microprocessors I (early evening)
- S.C.M. 5 - Understanding Microprocessors II (early evening)

Further details from:
Mrs. P. A. Ingman, Administrator
The Hatfield Polytechnic
P.O. Box 1108, Hatfield, Beds.
Tel: Hatfield 88190, ext. 343

UK 'lags behind' in new technologies

—NEDO CHIEF'S CRITICISM

THE take-up of new technologies by UK industry was strongly criticised by the National Economic Development Office in a report presented to its council meeting last week. NEDO director-general Geoffrey Chandler said that while our overseas competitors were modernising rapidly, UK industry was lagging seriously behind, particularly in such areas as office equipment and machine tools.

600 Mbyte disc on ICL 2900s

THE 600 megabyte Control Data disc drive has finally emerged in ICL colours as the FDS-640. A second new drive, the FDS-180 can be mixed with EDS-50s to give a maximum of 5,120 megabytes per string. The existing disc controller will support a new fixed and exchangeable storage coupler on the 2905, 2950 and 2856, while a new controller is needed on the 2960 and all large systems. Prices range from £15,000 for a 160-megabyte drive to £160,000 for eight 640-megabyte drives.

ICL 2980 users can now run a dual processor 2980 under the DME/1800 emulation for George 3, giving up to 80% more throughput and going some way to meeting the demand of users for extra power under DME.

Finniston plan gets cautious welcome

A CAUTIOUS welcome has come from most professional bodies, including the British Computer Society, to the recommendations of the Finniston Committee on Engineering and its proposal for the setting up of an Engineering Authority (CWI, December 20, 1979). A government decision on whether to implement the recommendations is expected in the summer.

Some institutions claimed the authority would be expensive and unnecessary. Industry Secretary Sir Keith Joseph did not comment on the proposals but said that engineering in the UK was burdened with "overlapping snobberies" — intellectual, anti-business, anti-engineering, and anti-enterprise. These must be overcome for the benefit of the economy.

Among the reasons for this, according to NEDO are: insufficient knowledge among potential users; technological gaps in the hardware and software ranges offered by UK suppliers; inadequate co-ordination of effort between information technology suppliers and the makers of manufacturing plant; and shortage of staff.

Some industry sectors where the UK is not lagging behind, Chondier said, include food and drink manufacturing and mining.

Imports of electronic office equipment are particularly high. The NEDO sector working parties covering office equipment, computers, and telecommunications have set up a joint working party to deal with the convergence of their technologies and stimulate the use and manufacture of office systems. Its work will include identifying UK strengths and weaknesses and what can be done with them; reviewing standards; and identifying future applications.

Financing of new technology ventures needs to be assisted, NEDO says, possibly with a loan guarantee scheme.

The need for both sides of industry to consult on the introduction of new technology was broadly agreed by all the parties at last week's meeting of the National Economic Development Council. The Prime Minister, Margaret Thatcher, who was in the chair, put it: "We have to get together on change," after affirming the importance of increasing the rate at which the UK introduces new technology into industry.

"It is vital we keep ahead of our competitors," she said. The CBI agreed to start talks with the TUC on a collaborative approach to the problem, but would not agree in toto to the checklist of points that the unions said should be settled before any changes are made at any firm.

The checklist did not include anything about productivity or profitability, the employers said, and it would not be possible to get agreement on every change before it happened because the change could then be too late.

The Prime Minister said there should be more contact between industry and universities and schools.



Girobank installs £1.2m TRACE equipment

A GIRO customer receives a statement each time his account is credited and the statement is accompanied by a relevant transfer document. The job of sorting documents into the same order as statements is now being handled at the Girobank computer centre at Booter by the Recognition Equipment TRACE configuration.

The TRACE equipment, worth £1.2 million, includes two readers/sorters that capture machine printed data in the form of optical and magnetic characters simultaneously from each document. At the same time the data is bar coded on each document by an ink jet printer and the bar code is used on later document passes for sorting.

The statements are printed by the ICL System 4/70 mainframe at the Girobank centre using magnetic tapes generated from data originally captured by the Lundy Farrington OCR terminals ordered by Giro in 1977 (CWI, September 22, 1977). The terminals are used to read machine printed data from documents and also to key handwritten information like the amount and payee account number on to each document.

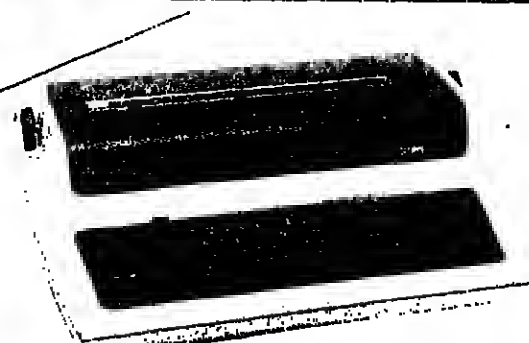
Pay award

APEX computer staff at British Aerospace's Chester site have been awarded a 5% pay increase on top of the company's annual increase by the Central Arbitration Committee.

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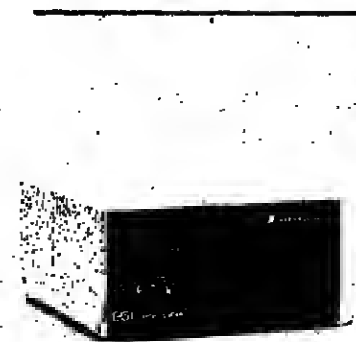


HEWLETT PACKARD 2645A DISPLAY STATION
The Hewlett-Packard 2645A is a sophisticated and flexible interactive terminal providing substantial on-line capabilities. Optional features include: 1. Optional dual cartridge tapes provide up to 110K bytes mass storage for each tape and are easy to use with fast search times. Denset decks include data entry, editing and programme preparation.



TEKTRONIX 4012/3 GRAPHIC DISPLAY TERMINAL
The 4012/3 is a microprocessor controlled, high-speed system featuring over 200,000 usable characters storage. A powerful disc editor and high speed string search provide ability to add, delete or replace data with one command. RS232 compatible interfaces provide connection to virtually all data processing equipment. Dual connectors are included for use with data terminals, minicomputers, modems and time-sharing systems at switch selectable data rates from 110 to 9600 baud.

TEXAS INSTRUMENTS 745 PORTABLE
The 745 is an 80 column, thermal printing terminal with a built-in acoustic coupler and EIA interface. The quiet coupling 5 x 7 dot matrix print head prints at operator selectable speeds of 10 and 30 characters per second. Standard ASCII keyboard with calculator type embedded numeric keypad and two key rollover feature. Complete with its bracket-like carrying case the 745 weighs only 13.5 pounds.



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Call us later

Downtime

by Chad

Beware quarks!

I WAS doing a little light reading the other day, browsing through IBM Research Highlights, when I came across a headline "Quarks may have triggered Big Bang."

This is to do with a sideline of IBM's, you realise the Big Bang is not some spectacular system crash but the creation of the universe, and quarks — well, quarks are a bit like leprechauns. They are very small, and no one has ever seen one, but we are assured on good authority that they exist.

Apparently there are hordes in Yorktown Heights who, when they have a moment while hovering away at new contraptions for doing people's sums for them, are exploring the mysteries of the cosmos. "Quarks may have triggered Big Bang" is their latest theory.

You have to admire the style of the thing: they take the smallest-scale, most impenetrable, finger-in-the-wind theorising there is and combine it with the largest scale, equally impenetrable speculation and produce a grand unified hypothesis "Quarks may have triggered Big Bang."

And indeed they may! On the other hand, maybe they didn't. We will never know, will we, unless we find someone who was there and remembers? His

index-linked pension will be pretty high by now.

It is always nice doing research that has absolutely no relevance to real life — then you can't be blamed for the ravages that technology wreaks on us.

All this triggering, the IBM men tell us, took place within one ten-thousandth of a second after the start of the universe. Out what was going on before then? We ask. Ah, meaningless question! Comes the reply. By definition the universe is everything, and so there isn't anything outside it or before it. Hmhmhm.

I believe that this answer is yes, and that this is precisely what Design by Objectives attempts to do. The assignment of objectives is explored in about 300 pages in my Software Metrics book, and I have recently completed a similarly extensive manuscript on Design by Objectives, which would begin to answer the "levels in a structured design" part of the question.

But I know that a lot of people are interested in better system architecture methods. So let me try to answer the question within my space constraints.

1. I believe, based on experience of doing it for ten years, that all critical system objectives can be stated in quantified and measurable form. This is, of course, fundamental to control of the design process.

2. To accomplish this, it is often necessary to explode high level goals (such as security)

into several lower level goals (such as "probability of security cleared employees gaining access to data for which they are not cleared").

3. It will also be necessary to accept less-than-perfect measuring methods. The accuracy and reliability need only be sufficient initially to improve the predictable ability we have presently to meet our system objectives.

4. I believe that one important component of this strategy is the conscious use of an evolutionary design and delivery method. That is again based on years of experience in practising what I am preaching here, that we must spread the bulk of the design and analysis and planning throughout the project. This must be interspersed with partial incremental system delivery to the real end user. Partial delivery gives feedback, a more realistic form of analysis, from reality. This feedback must be used to tune the overall system design strategy and planning to a more realistic level.

5. Design specification can be top down, not only in functional specification as is commonly practised today, but also in specification of all objectives, and in the specification of design components in logware, dataware, hardware and peopleware. "Functions" needs to be explained here. I use the term for those absolute user requirements over which the designer has no control. I use the term (design) "components" for those decisions which are the options of the designer, and which are specified in order to allow the system implementation to meet the stated objectives. This might seem a bit formal if you are not used to thinking in these terms. But I find it a quite useful and necessary way of thinking about, and specifying design. So if you are looking for something better, please consider the division of specification concepts into functions (user-required content), objectives (user-required attributes) and design components (designer specified means for getting the attributes).

6. "Must we rely on common sense?" No. I believe that Design by Objectives contains a teachable, repeatable and automatable route for specifying system designs.

Using a database of Technique/Attribute tables stored on a computer, we should be able to feed in a set of system objectives, and get at least a short-list of design suggestions. I fear that for many years to come we will require a lot of common sense in this process. But I do believe that we can

become far more systematic than we are at present.

My own Apple II is scheduled to be used as an expert prototype for this automated design method. I certainly would be interested in sharing these ideas in more detail with any reader who is prepared to put in a substantial amount of work to develop a research or commercial product which would be a designer's tool.

One component of the method is the Technique/Attribute Handbook (see T/A handbooks consist of tables, for example a table of costs and maintenance effects of alternative machine technologies might be one).

The attributes specified in T/A tables must be compared to the objectives (which are also called "the attributes") of our project system design. A major part of the design process is looking for one or more suitable entries which will provide a set of attributes required by the system or sub-system of interest.

Further development of facsimile networks is supported by the Nexos M5412 switching unit, which allows simultaneous transmission to any combination of receivers, and abbreviated dialling of programmable conference parties.

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GILB'S MYTHODOLOGY

We can formalise system design in a structured way

A READER, Lyn Antill of the Polytechnic of the South Bank, London, reacting positively to the several columns on Design by Objectives methods, still asks "How to assign objectives and controls to particular levels in a structured design? Must we rely on common sense or can we design a control methodology analogous to a structured programming methodology?" (Letters, October 2, 1979).

I believe that this answer is yes, and that this is precisely what Design by Objectives attempts to do. The assignment of objectives is explored in about 300 pages in my Software Metrics book, and I have recently completed a similarly extensive manuscript on Design by Objectives, which would begin to answer the "levels in a structured design" part of the question.

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French manufacturers to produce low cost devices, has begun talks with them which may lead to marketing agreements.

The company also feels that vested interests have tended to prevent telecommunications and computer companies from realising the full potential of the office systems market.

Nexos' strategy of forming partnerships with appropriate companies is designed to help them enter a larger market and to stimulate or even to fund the development of products to fit into an overall office systems architecture.

The French PTT plans to stimulate the production of low cost digital transceivers by placing an order for 500,000 with one of four domestic manufacturers which are currently each building 50 prototypes for evaluation.

This contrasts with the situation a few years ago when manufacturers deliberately made their machines incompatible with those of their competitors and PTTs discouraged the attachment of strange machines to their jealously guarded voice networks.

The new aim is to create conditions under which fax users can contact each other directly in the same way as telex and telephone users.

The Nexos G400 is imported from Oki, the Japanese computer peripherals manufacturer, to be sold in Europe under a licence agreement concluded jointly with Multired last summer, shortly before the link between Nexos and Multired was publicly announced.

Although CCITT is expected to ratify in April a Group 3 recommendation for transmitting on A4 page in less than one minute digitally, a steady market is forecast for Group 2 devices for several years.

Nexos intends to keep up with the most advanced technology compatible with a large market and, recognising the power that the French initiative will give to

become far more systematic than we are at present.

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The cost of sending an A4 sheet from London to Aberdeen could vary from 10p to 70p.

The device can send up to 30 documents automatically from a stacker and it also allows local copying, although not in real time, with a paper cost of about 4 1/2 p per A4 sheet.

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The device can send up

An unconventional approach to Basic language teaching

WITH small computers and languages such as Basic, there is an increasing number of people who are capable of programming but who are not professional programmers, and in whom the ability to program is only secondary in their main occupation.

As micros become a part of everyday life, the demands for teaching programming languages to the non-professional are on the increase.

For these reasons Richard Mayer, of the University of California, chose Basic in an article which examines the psychology of learning a programming language. His paper addresses the questions: What does a person know when he has acquired the knowledge to write simple Basic programs and how should a teacher effectively instruct a person so that he will acquire this knowledge?

As with most Americans, Mayer dwells laboriously on the psychological causes and effects of grasping a few basic concepts which English people seem to master without any apparent mental traumas. However, he does raise some interesting points about how a tutor should go about teaching a language like Basic to a programming novice.

What his piece boils down to is that people need to acquire the basic skills to learn Basic. These are: To analyse a statement into more specific statements or "pre-statements", to enumerate the transactions involved in each pre-statement, and the ability to group pre-statements into configurations.

This approach, says Mayer, emphasises the psychological concepts that underlie the relationship between program and output. The traditional method of teaching Basic, he says, does not do this.

"The traditional method of instruction," says Mayer, "is to help the learner see the relation between a list of statements, a program, and a certain output. Generally, statements are defined and examples are given; the learner is encouraged to en-

gage in 'hands on' experience such as typing in programs and seeing what output comes out."

Mayer's approach, which he calls the "translational approach", emphasises the appreciation of statements and their meanings before it emphasises the "hands on" part of the training. Anyone who has undergone the conventional training so despised by Mayer will no doubt be slightly confused by this, but his interpretation of the learning process dwells more on an understanding of the logic involved in programming rather than the actual writing of the program.

The argument is backed up by considerable evidence in the

form of experiments with college students who had no prior experience of programming. They were taught a simplified version of Basic, but half the learners were taught using a concrete model of the computer and each statement was explained to them as a transaction within the model. The other half received the same instruction but the emphasis was on grammatical rules. As a result, the "model" group performed much better than the "rule" group on problems requiring creative programming but not on easy problems.

So what does all this go to prove? Nothing, you might say, or perhaps nothing that we

didn't know already. But from the evidence we have in this country, however intensive, the approach to teaching programming languages is invariably the same and includes a description of a computer and then hurries on to the absorption of a list of grammatical rules. Even where practical work with the computer is included in the curriculum, rarely does a course demonstrate the translation of statements into changes within the machine.

On the other hand, there are those in our midst who are perfectly capable of grasping the concepts of programming amazingly quickly, for example 17-year-old Adam Laurie who

was featured on this page some weeks ago and actually abandoned an NCC course to teach himself Basic.

So how important is the psychology behind teaching programming languages? The most important deduction that can be made from Mayer's article is that there will soon be people who will need and want to learn languages such as Basic quickly and for purposes peripheral to their major concerns. For these people Mayer's suggestions are not only useful but are becoming more and more relevant.

* A Psychology of Learning Basic. R. E. Mayer. Published in Communications of the ACM, Volume 22, No. 11.

Strong carrying the weak?

THAT programming is a valuable and scarce breed is not a surprising statement. That many of them are incompetent, however, is a disturbing accusation.

According to several people in the industry there is a strong element of the strong carrying the weak within programming, and for every able programmer there are several others who are propped up by an enormous amount of aid and crutches.

Ron McQuaker, managing director of Master Resources, expressed his concern during an informal speech after presenting the first prize in our MRL/CV/Crossword competition.

He quoted a story that was told to him by a customer of his in 1953. The company had 50 "good" programmers and 200 "poor" programmers, and the 50 were used to create and maintain a special high level language for the 200 to write applications. A similar company in South Africa was running an identical range of applications using a maximum of eight programmers.

McQuaker was concerned that all these aids did not, as they are intended, raise productivity. Are systems now implemented with less effort and on shorter timescales than before?

Machine efficiency has definitely been sacrificed in pursuit of these goals; but so hardware

costs have fallen this does not seem to matter too much.

McQuaker is convinced that so-called aids are often more of a hindrance to the programmer, as well as overheads in the machine.

"The biggest obstacle is in finding out what they do and the bizarre conventions needed to make them work," he explained. "They become a long time ago specialisations within specialisations. This trend was given a major boost in the early '70s. One large manufacturer discovered not for the first or the last time that the competition was technically way ahead of him, and that he had better try to introduce multiprogramming in a hurry."

"The software didn't work very well, so installations built up their own teams of experts to understand and sort out the supplier's software. Thus the user-based systems programmer was conceived. Many tasks could be programmed from a scratch quicker than a utility could be set up, never mind learnt."

Consequently devices known as aids often turn out to be quite the reverse. "They impose a formidable series of learning requirements, a mountain of incomprehensible manuals and an immense amount of code to be corrected. No-one ever seems to have measured the net gain, unless it be to the suppliers who,

after all, provide all of this at a price which includes a profit margin."

Languages such as Basic and the availability of small computers such as the Commodore Pet make one realise that perhaps things are taking a turn for the better and programming will no longer be such an intricate and unnecessarily complicated task.

If it is allowed to happen, McQuaker's reflections on the development of programming are food for thought. But how do all these incompetent programmers feel about their value? And in particular what are their opinions, if any, on the so-called aids which are supposedly supporting them? Page Six, as usual, will be glad to hear their ideas.

'Why does no one want to give me a job?' asks Chris

AS we seem to have written this week mainly about programming languages, it was a change to receive a letter from a would-be programmer who has no intention of learning any of them.

Chris Blackmore, of Ilminster in Somerset, writes, "I am a Nascom owner. I have just written a Pilot Interpreter which runs on any of the available monitors. Perhaps you can explain why no one wants to give me a job as a computer programmer."

Unfortunately I can't explain, except to proffer the perhaps feeble argument that experience is always necessary and most employers now insist on mandatory years in the business before even considering a prospective programmer.

But Chris goes on to say, "Don't tell me I need two years' experience of Cobol. It is an appallingly bad language. So is Pilot. And Basic."

"I program best in machine

code," he continues, "and nobody wants to know. I think they can see it is better in terms of efficiency and ease of use. There's a closed shop being run by programmers or owners of huge machines. They are terrified of me and my friends, but we are here to stay."

An ominous threat, but one which will probably be ignored by most, not because they are dismissive about machine code, but more likely because they are unaware that people like Chris Blackmore do exist. Even if they are aware, they would find it very difficult to slot such a person into the conventional programming team which is behind most installations.

Is there anyone out there who has actually made it in machine code?

Puzzler

I HAVE just received a most unusual Christmas card from friends in the US. It reads:

"Dear Puzzler,

D & J
ANDRE
SEND +
CHEER

... and would like you to know that E = H."

Most ingenious — and quite unique in my vast collection of alphametics. All 10 digits are represented, with nought being very easy to find of course.

See page 63 for solution.

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by Judith Morris

Big changes on the way for Cobol programmer

THERE is little doubt that the advance of technology will bring radical change in the world of that mythical programmer, typical Cobol programmer, today.

The subject came up at a presentation, where the view was put that there will be a growth in the use of automatic software generators. At the same time there will be a generation of school-leavers, whom writing, say, a program, Basic is about on a par with solving a quadratic equation.

With the falling cost of hardware, the use of software generators must become a norm, was one comment. "Today's programming methods are like cutting the lawn with a pair of scissors. The present on software houses to produce custom software quickly: they need a more efficient than writing yet another program, or accounting suite, or search. And as the price hardware falls, every school is able to afford its own Apples and they will be standard equipment."

"Professional programmers and analysts will increase; have to move up-market writing system software: compilers and so forth."

Among the benefits of the tools is the ability to write portable modules at different times which can mesh together as a single program. In addition, standardisation and the use of automatic documentation generators is possible to use software which can be understood by the people who have to extend and modify it in the future — even if they never see it before.

The fact remains that many of the everyday jobs filled today by programmers will begin to disappear, and people should be to think now about what they want their career to go. That most obvious choices are to acquire the additional skills required for really complex, grunting tasks, or to learn enough about the business of the employer that they can apply that knowledge in other capacities within the company.

These automatic software generators and similar productivity tools do not exist. Why are they not widely used? Page Six will like to hear your views.

SOFTWARE FILE

Elegant entry into JCL market

THE JCL management market has been entered by Computer Associates with its systems software package CA-Driver.

The product is intended to solve problems associated with the proliferation of JCL in expanding DOS/VS and DOS/VSE installations for which Computer Associates presents it as "an elegant alternative to OS".

The package aims to improve job scheduling and execution and, according to Computer Associates, goes further than OS in providing security, control and flexibility.

Computer Associates also claims that Driver "contributes to more efficient use of hardware resources, increased throughput and improved programmer/operator productivity".

The product is as yet unchanged in the field of providing

DOS users with facilities comparable to those available under OS. IBM's own Interactive Computing and Control Facility offers job management for DOS/VSE but its range is limited, and Computer Associates has been quick to fill the gap with its own answer to DOS job control problems.

Dave Torgy, Computer Associates' vice-president of marketing, said that Driver had already met with an enthusiastic response from users in the US, where it was released over two months ago. It has a dozen customers there already and its recent European trials look promising.

A Computer Associates spokesman in Europe predicted a wide market for the product. "After the initial happy response to IBM's announcements on software policy, customer are

coming down to earth. There are 6,000 disappointed customers where VSE is concerned."

CA-Driver provides procedures from a disc-based central JCL repository with storage, maintenance and retrieval facilities. The operator can tailor procedures at execution time using features such as procedure expansion, symbolic parameter substitution and condition job step execution. It is available in the UK at an introductory price of about £4,580.

The product is as yet unchanged in the field of providing

The product is as yet unchanged in the field of providing

ICL sale saved by APL language facilities

THE partnership of BOC Datasolve and ICL Dataskil to develop and sell APL language facilities on the ICL 2900 has borne results with a sale to the South African Mutual Life Assurance Society.

Extended time sharing service

IN response to requests from clients, the scope of the APL time sharing service offered by ICL has been extended. An APL system identical to that which ICL has been offering as an in-house product for corporations with a dedicated IBM-compatible processor, it is now available under DOS/VS as well as MVT, MVS and VM.

Another option on the package is a worldwide communications facility using Sharp's own network. The package is offered at £48,000 with installation, training, conversion and support included in the price.

The availability of full interactive facilities under VME/B as made possible by APL is believed to have "saved the sale" for ICL. The society has two 2907s at present, but would have turned to IBM had ICL not been able to offer the APL service.

It was in anticipation of such a need among customers that Datasolve and Dataskil undertook the joint venture nearly two years ago (CW, February 18, 1978). BOC Datasolve already has considerable experience with its IBM-based APL service and puts great confidence in APL as a significant and rapidly expanding area of interest.

The project for Dataskil was completed in June and is seen by both companies as a timely addition to the 2900 system product range.

Two licences for 2900 APL have already been sold and one of Europe's largest users is currently giving the product a trial.

Gresham enters fight for online systems for 2900s

ENTERING the fight to provide ICL 2900 users with online software systems is the Southampton firm Gresham Computer Services. Gresham has just announced VECOMS TP 2900, a system said to provide a total online environment for the implementation of transaction processing systems on the large 2900 range.

The system runs under VME/B and uses the standard ICL TP option, streamlining and building on ICL's own software. The firm has been working on it for the last three years, aiming

to fill what it saw as a gap in ICL services.

Gresham emphasises the comprehensive control offered by VECOMS as an advantage over Telematics' TP5. The system is a of modular design including monitoring, performance and security facilities and applications routines as well as other ancillary software products.

VECOMS TP 2900 costs £18,000 and Gresham says that it has already aroused considerable interest.

Gincom enhances T-task

THE online interactive query facility T-task, developed by Gincom Systems for use with its database management system Total, has been enhanced to include task-level recovery, CTAM support and other features which Gincom says will improve the overall performance and efficiency of the product.

Having canvassed the product's 70 or so users, Gincom introduced improvements requested in Release 8.1 of T-task. According to Larry Booth, general manager of Gincom's systems software division, the performance improvements "enable the user to initiate more complex queries by increasing the amount of information that can be stored in Total files."

by Claire Gooding

Standard for M-series?

THE Australian developed job control system JOL has won a contract from the Australian Bureau of Statistics to supply the language for its new Facom-based DP installation.

Facom's parent company, Fujitsu, is negotiating with JOL's originator, Clarho Computer Software, to make JOL the standard control language for all its future M-series mainframes. JOL aims to replace the complex IBM JCL, giving users of OS systems a powerful management facility and programmer language (Software File, November 15, 1979).

CS has decided to develop the product further to make it available to DOS users.

Dataskil to market general inquiry pack

A GENERAL Inquiry system for the ICL 2900 series which was developed for in-house use by a large stockbroker firm, is to be adopted for marketing by ICL Dataskil.

The product, called Genie, is a procedure-driven Inquiry and data manipulation language for use with the IDMS database. It is said to be fully interactive and designed to be used with equal ease by staff of all levels.

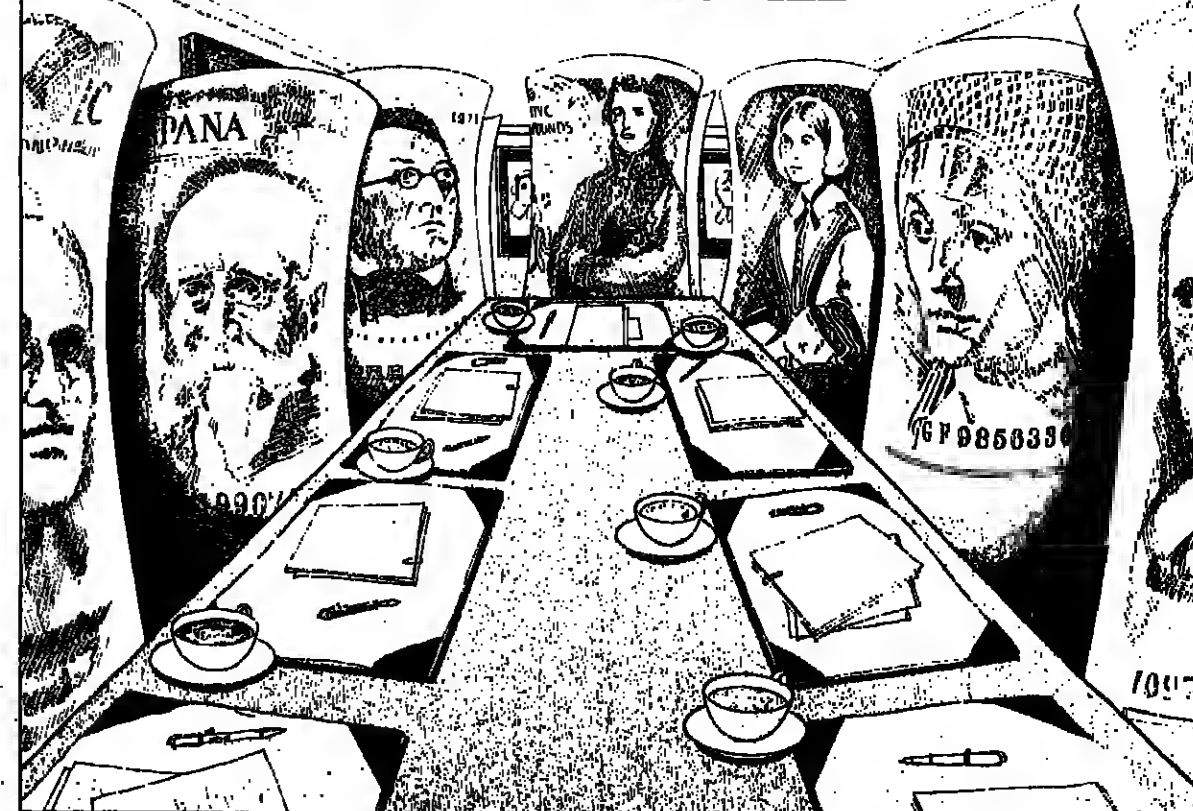
The firm, Mullens & Co, is the government broker as well as having business in the equity market. The need for fast, easy and accurate access to large

volumes of market-associated data which is often transient, has given rise to Mullens' expertise in Inquiry and data manipulation systems. But this is the first time that a system for its own use has been designed with other users' needs in mind.

IBM price rises

PRICE rises recently announced by IBM affect software products by 10%. At the moment the rise affects only Canada and the US, but UK users will derive little comfort from IBM's cautious statement that it "can't comment on the UK yet".

"And now, I move a vote of thanks to Dataskil"



If your money's being wasted — by unrealistic stock levels, for example, or inadequacies in production, or wrong forecasts — you often don't know until you see the profit and loss account.

By which time it's a bit late. And if you have to choose between a set of financial options, how can you be sure you've taken account of every implication, without trying them out in practice?

Helping you three ways

Dataskil, one of Europe's leading software houses, can help you find out the answers before it's too late. We do it in three ways: by consultancy and project management, helping you to identify problems and come up with the answers; by supplying the programs that will perform the required task; and by helping you — if you wish — to run your system once it is installed.

With one or all of these services you have the means to keep yourself fully and continuously informed of changes in any parameter you need to monitor; you can answer every "what if?" question; plan every critical path and be sure you have the best one; model any operation and evaluate any plan.

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Dataskil is already established in the UK, France, West Germany and Holland. Our customers include the Ministry of Defence, Metal Box, J. Sainsbury, Courage Limited, the AA, Securicor, Dixons Photographic, Central Electricity Generating Board, Heugan, and GAK of Amsterdam.

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OP SPOT

Job control section can ease pressure

THE job control section has a vital part to play in the day-to-day running of the installation.

By performing such off-line functions as scheduling and job assembly and dealing with user inquiries, it takes pressure off staff in the computer room, enabling them to get on with their main task of optimising throughput.

At some installations the section is staffed on a full-time basis, often from 9 to 5 — while at others the operators move between on-line and off-line areas on a rota basis.

The section made up of job control specialists offers a high level of expertise, but does have certain drawbacks.

It is inevitable that each member is able to concentrate on certain applications and can

therefore establish a rapport with "his" users.

This makes it much easier for the job controller to deal with a user who, for one reason or another, is dissatisfied with the service provided by the operations department.

On the debit side, the section may become "detached" from the computer room and ill-feeling between the two areas is not uncommon.

That was certainly the case at one installation I know, although open warfare may be a better description of the state of affairs that existed there.

Arguments and bickering between the head of job control and the duty shift leader were an almost daily occurrence. And when the operations manager got involved he only succeeded in making matters worse.

If a job were more than a few minutes late on turnaround the job controller would complain to the operations manager and shift leader, in that order.

The shift leader would retaliate by instructing his operators not to resubmit work that had failed because of errors on job control's behalf.

All a bit childish, really.

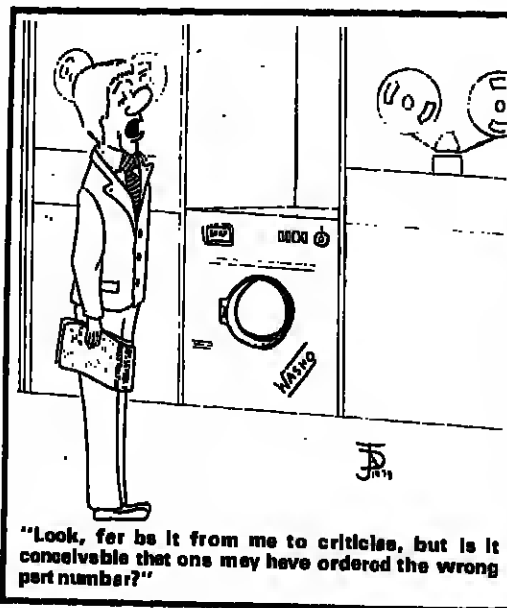
As I see it, the best method is to have one or two job controllers and employ operators in the area on a part-time, rota basis.

That way the operators and job control staff are much less likely to be at loggerheads with each other over errors or respective shortcomings.

For their part, the operators get a better all-round knowledge of the operations function and that can only be to the benefit of the department.

by Bernard Allen

Best spectacles for the operator with poor sight



THE operator with poor sight faces a problem because conventional glasses — those intended for reading or long distance use — often prove an inadequate aid for viewing VDUs.

Bi-focals — glasses for reading and long distance use — are similarly ineffective as VDUs are most frequently viewed from an intermediate, arms-length distance.

One solution is to have a separate pair for the task. But that is not practical as the operator must also read paper documentation (a short distance task) and watch what is going on in other parts of the computer room (long distance).

For reasons such as these the Optical Information Council advises operators to consider certain other glasses.

In a paper called Visual Display Units: Their Effects on the Eye, it points to the so-called tri-focal lens which, as the name implies, has three focal areas — for short, intermediate and long distance.

Better still is the varifocal lens which caters for all ranges between the short and long distance. These are also extremely better than tri-focals as there are no apparent divisions between the focal areas.

The paper advocates all-must spectacle rims for the high powered lens but adds that they should be as slender as possible as a nut to interfere with sideways vision.

The Optical Information Council is at Walter House, 422 The Strand, London WC2R 0PB.

Jobs wanted for five TOPS students

A TOPS operations course recently finished at Borehamwood College, Herts, and five of the students are now seeking permanent positions in the industry.

All would prefer jobs in or near their home towns, but some are willing to re-locate, according to Derek Pinnock, operations lecturer at the College.

The students hail from Maidstone, Southampton and Luton, and another two, a married couple, are living in the Milton Keynes area.

Pinnock told me, "The boy from Southampton has had no luck in that area, so he's prepared to move to London or the Home Counties to get work."

"The one from Maidstone in Kent has had no luck, either and his second choice is South London. I think he's got relatives in that area."

The next TOPS operations course at Borehamwood College starts in April.

Wrong date

TWO weeks ago I mentioned the newly formed NCR 8200 Series User Group's next meeting in London, but gave an incorrect date. It takes place on January 24 and the venue is Credit Control Insurance, 120 Regent Street, London, W1, starting at 7.00 pm.



Home from Hong Kong

JOHN PENWARDEN, the *De Voo* senior operator featured in this column towards the end of last year, has just returned from his latest overseas assignment. He spent seven weeks in an operator training and support role at the Hong Kong Telephone Company, in Hong Kong.

Anthology of Presentations

THE George 2 user group has been inundated with requests for copies of its Anthology of Presentations, a collection of lectures and hints given at past meetings over the past few years.

But the group has said no. And I have been asked to explain patience from those awaiting copies. More are being printed.

The George 2 user group Anthology of Presentations costs £1.50 and orders should be made payable to the George 2 User Group.

Apply to Ron Little, Manchester Polytechnic, Computing Services, John Dalton Building, Chester Street, Manchester, M60 2BD.

Burroughs launches its Scottish-designed B90 business system in UK

THE Burroughs B90 business computer, designed and manufactured in Scotland and launched in the US late last year (CW, October 25, 1979), was announced in the UK last week.

The new machine, which comes in two models, B91 and B92, is completely compatible with the B80, which it replaces, and while all B90 operating software and packages are supported on it, the announcement includes no new software.

The processor is built from a new Burroughs eight-bit four chip set, which doubles the cycle speed of the B80 processor to 500 nanoseconds. The technology is n-channel MOS. Memory addressing is expanded to 512K-bytes, with 128K-bytes the minimum capacity.

Entry price for a B91 with 128K memory, 90 cpha console matrix printer, display switchable between the 256-character standard of the B80 and full 1920 characters, and six megabytes on two double-sided double-density floppy discs, is £12,000. The 256 character plasma display remains an option on the B90.

Most striking feature of the

new machine is the double-sided double-density floppy disc unit which stores 3 megabytes on a single floppy disc.

Developed in Scotland and at present manufactured only there, it uses a new disc supplied to Burroughs' specifications by three vendors, and as already reported (CW, November 29, 1979) this is to be offered as an OEM product. Apart from the high capacity, the drive also features an access time of 157 milliseconds, compared with the average 250 to 500 milliseconds of floppy drives. To give further protection to the disc, it is stored in an additional rigid plastic sleeve; the sleeve is only removed from the disc once it has been mounted on the drive, and has to be inserted around the disc before the latter can be removed from the drive. The drive is controlled by an integral Motorola 6802 microprocessor.

The B90 is built in Scotland, and at Plymouth, Michigan. Burroughs says that the elements of the Scottish-built systems are overwhelmingly sourced in the UK.

As well as being used in

stand-alone mode, the B90 can support up to eight local terminals, and the 91 model offers two and the 92 model four remote communication lines. The B90 can also be used as a banking terminal controller and can communicate with all other Burroughs computers using the Burroughs BDL protocol. IBM 3270 and 3790, and some ICL protocols are also supported.

The B90 runs under the CMS operating system, and supports up to nine concurrent applications. The same operating system also runs on the B900 and B1900 lines, and languages available under it are Cobol, RPG and Burroughs' Network Definition Language.

Burroughs says it already has more than 500 UK orders for the B90 and that deliveries will begin in February. Over 4,000 B80s have been installed in the UK, some 1,500 of these going to two of the big banks, Barclays and National Westminster.

The two banks want a total of 3,350; Barclays is using its B80s in Burroughs TC 3500 emulation mode, and NatWest is using IBM's SDLC protocol.

Bridge writer's challenge

BRIDGE writer Victor Mollo has issued a challenge, at odds of five to one, to any computer to beat him either at rubber bridge or a match. Originally the challenge was to expire at the end of 1980 but Mollo said he would be prepared to extend it. His action was prompted by what he saw as the poor quality and high cost of an electronic bridge machine currently on the market.

Korean phones contract worth \$1,000m

WESTERN Electric International has won a contract from the South Korean government to supply telephone exchanges and to equip local companies to make them. The contract could be worth \$1,000 million over five years.

The present Korean telephone network has a capacity of 20,350 lines based on ITT Metocenta 10CN stored program controlled exchanges and this is to be built up to two million lines using the Western Electric No 1 AESS central exchanges.

Several international telecommunications manufacturers have been negotiating with the Koreans and other contracts may result from the long-range modernisation and expansion of the network.

IBM drops System 38 emulation for System 3 users

IBM SYSTEM 3 Communications Control Program users wishing to move to System 38 will have to convert directly to System 39 native operating mode. The company has confirmed that the emulation facility for the System 3 CCP announced for System 39 has been withdrawn.

The company also says the new System 39 configurations announced two weeks ago (CW, January 3) supplement the models originally announced and do not replace them.

Memory configurations offered on System 39 Model 3 are 512K, 1 megabyte, 1.28 or 1.5 megabytes. On the Model 5, memory ranges from 512K-bytes to 2 megabytes.

While it is unusual for upgrades to be announced to a machine six to nine months before shipments are made, and for the upgrade to be available at the same time as first shipments, the case of System 39 is unusual in that first deliveries will now be made almost a year after originally intended.

IBM insists that the additional memory has nothing to do with the software problems which have held up the machine, and that it simply offers the user more configuration flexibility.

The aids originally announced for transferring programs running under the System 3 Communications Control Program have been cancelled.

System 3 communication users will now be offered aids to convert their programs to run in native mode on System 39. Users have been advised, however, not to expect the aids before May, 1991, although further details will be given later this year.

The new approach, said a spokesman, means that no second conversion will be required, and users will be able to use the full facilities of System 39, which would have been impossible under the original plan.

CISI acquires French bureau

CISI, the bureau offshoot of the French atomic energy agency, has acquired a controlling interest in another big French CDC bureau, Franlab Informatique.

CISI, which owns SIA in London with a Cyber 175 and a CDC 6600, has a CDC 7600, 6600, Cyber 173 and 172. With Franlab, it acquires a Cyber 171, Cyber 72 and CDC 7600.

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PEOPLE and EVENTS

Resignation of ICL MD in Germany

GERD GROBBINK, managing director of ICL Deutschland since ICL acquired the Singer subsidiary there in 1976, has resigned "of his own volition." His stop-gap successor is George Deadman, vice-president of ICL's European Division. The hunt is up for a German national to take over the post from Deadman.

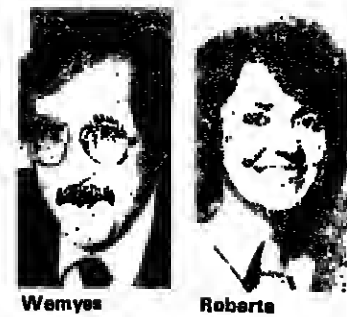
ICL's West German operation was a chronic loss-maker until the merger with the Singer subsidiary there, and Grobbink's appointment as managing director ended a period of rapid management turnover and frequent changes at the top.

Bob Chmley has become a director and shareholder of Merchint Systems, the newly formed software house. He is to specialise in the design of financial and insurance based systems. He was previously with the English Insurance Company.

Since the merger, the subsidiary has become profitable, and ICL has done much better business, not only with former Singer products but with the 2803 line and other traditional ICL products.

Systemsolve appointments

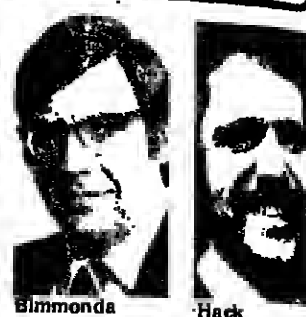
THREE new directors have been appointed by Systemsolve, the software and bureau house. Peter Wemyss and Derek Williams have been named respectively as sales director and systems development director. Douglas Eyelons, the recently appointed director general of the Computing Services Association and a director of BOC Datasolve has relinquished his seat on Systemsolve's board and Jim Dueker.



Wemyss



Roberts



Simmonds



Hack

Award for Frenchman

THE first CII-Honeywell Bull European Prize for Research has been won by Jacques Arsac for his work on the transformation of computer programs.

The prize is to be awarded every two years to people who have made a major contribution to computer science.

Arsac receives the award, worth 50,000 French francs, in recognition of his innovation in the teaching of and research into computer science and his personal work on functional languages, program transformation and source to source transformation systems.

A graduate of the Ecole Normale Supérieure in Paris, Arsac has held several appointments, including professor of programming in the science department of the University of Paris, director of the computer centre of Meudon Observatory and director, then president, of the scientific board of the Institut de Programmation.

Robin Dorricott has been appointed micro systems manager of Capper Neill Controls, the control and measurement engineers. He joined the company in 1963.

Tony Campbell has become an operations director for System Aid (Tour Processing).

DIARY

JANUARY 22 British Chapter, ACM. Conversation on Parallel Processing. Dennis Parkinson on Chinese Army Approach to Computing. BCS headquarters, 13 Mansfield Street, London, 18.30.

JANUARY 23 Data analysis. BCS Database users. University College, Torrington Place, London WC1, 14.00.

JANUARY 24 Data Protection. BCS Merseyside branch. Department of Science Lecture Theatre, Liverpool University, Brownlow Hill, Liverpool, 18.00.

JANUARY 24-25 IBM CUA programming group. Holiday Inn, Liverpool, Tel: 01-551 1843.

JANUARY 30 Natural language translation. Heriot-Watt University, Grassmarket, Edinburgh, 17.30.

FEBRUARY 4 Meeting. BCS Fortran specialist group. Heriot-Watt University, Edinburgh, 10.45. Tel: 0833 554455 ext 165.

The use of microcomputers in electricity distribution. BCS East Anglia branch. Russell Road, Ipswich, 18.00.

Visit to Open University, BCS Bedfordshire branch. Milton Keynes. Apply via secretary. Tel: 01-837 0471.

FEBRUARY 6 A look at the new Anal Cobol standards. BCS North West London branch. Railway Hotel, 390 Oldfield Lane, Greenford, Middlesex, 19.30.

FEBRUARY 7 Visit to Lloyds, BCS Kent branch. Chatham, 19.30.

The future of BCS and presidential visit. BCS Chester and North Wales branch. Half-Way House, Cae-nah's Quay, Clwyd, 19.30.

FEBRUARY 12 Map-making by computer. BCS Croydon branch. Fairfield Halls, Croydon, 19.15.

Voice response systems. BCS Harlow sub-branch. Saxon Inn, Harlow, 19.30.

Use of computers in MR weather forecasting. BCS Newcastle branch. Barras Bridge Rectory, University of Newcastle, Newcastle, 19.00.

FEBRUARY 13 Technical directions. BCS Bristol branch. St Vincent Rocks Hotel, Clifton, Bristol, 19.15.

Computers in newspapers. BCS North London branch. West Lodge Park Hotel, Cockfosters, 18.45.

CAD at Fords. BCS Sussex branch. County Hall, Lewes, 18.30.

Computers in the 80s. BCS Humberside branch. Hull College of Higher Education, Hull, 19.30.

FEBRUARY 14 Have computers any place in the doctor's surgery? BCS Oxford sub-branch. Staff College Lodge, Oxford Polytechnic, Oxford, 10.45.

MARCH 27-29 The changing balance of man/technology. IDPM, Bournemouth. Details: 01-658 0171.

Livreare File

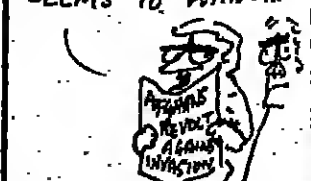
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MICRO NEWS

First micro with bubble memory

THE Index System 100, now entering the UK market through a newly-formed distributor Dukstate (CW, January 10), is one of the first microcomputer systems to boast the use of bubble memory storage. Through its means an inexpensive option on the system, it marks what could be the start of a growing trend, especially in the sector of the market that System 100 is being aimed at — the fully integrated portable computer for the professional.

Based on a Z80 processor, with a minimum of 48K-bytes of RAM, it packs considerable hardware into its 10kg total package.

This includes a thorough six-line by 40 character plasma display, a mini-flappy disc drive offering either 200K-bytes or 400K-bytes, a 72-key keyboard with numeric keypad, and either a 21-column or 132-column thermal printer. There are also 64 parallel I/O lines and either two or four serial ports.

Other options that can be built in include a battery back-up power supply, an acoustic coupler, and a 32K Basic Interpreter in ROM.

In normal circumstances the Basic is loaded via disc into RAM, leaving 16K available to the user, though the amount of RAM can be expanded up to 2M-bytes with external modules.

Other languages available include Fortran and Cobol, but applications software support is as yet limited. In this country Dukstate is currently negotiating with several software companies, including CAP, for applications software packages.

It is the option of replacing the mini-flappy disc drive with a bubble memory secondary store that is probably the most significant aspect of the Index equipment, because it is one of the first to offer such an option, and also because of the price being asked.

The standard machine, including the disc drive, is priced at £3,400 in this country. The bubble memory option comes as 128K-byte capacity modules which cost £1,500 each. However, when incorporated into the system with a controller, the total price for a module adds £2,000 to the price of the standard hardware.

Obviously the price will drop in time, especially as the capacity available from individual chips increases. It will be interesting to see if it drops quickly enough to impinge on the dominance of the floppy disc.

Keen to handle the Pet

A RE-ORIENTATION in market approach is taking place at Keen Computers, for the company has become a Commodore dealer, selling Pet business systems.

Until the middle of last year, Keen had been one of three main distributors in the UK for Apple. Then Microsense was appointed as UK master distributor by the US manufacturer, and Keen, with Personal Computers and Lynx Computers, was demoted to sub-distributor status amid much misunderstanding and acrimony (CW, June 28, 1978).

Dr Tim Keen, managing director of Keen Computers, said last week that he had reviewed what his company would sell this year and where.

"We have had great success in the big computer and educational markets with Apple," he said, "but not much success in the small business market."

"With Commodore as the leading supplier, we decided that if we couldn't beat them, we would join them. In the end it was the Commodore software that convinced me."

Keen will continue selling Apple into the markets to which he feels it sells well — education and large organisations.

by Martin Banks

Isher-Woods moves into small systems leasing and support

LEASING facilities for micro-computer systems are coming under £5,000, a hardware and software support programme, an information 'club', and an agreement with software house LD Computer Services are among the new capabilities of Luton-based Pet systems dealer, Isher-Woods.

The company is restructuring itself with an internal division that brings into play two new companies, both aimed at providing services for other micro-computer dealers rather than for the end user.

First of the new companies is Link Financial Services, which will offer through both Isher-Woods and other dealers a leasing facility on the lower ranges of microcomputer equipment.

According to Isher-Woods director Robin Woods, the majority of finance houses that offer these facilities are unsympathetic to the provision of leasing or financing deals on equipment costing under £5,000.

To back up the leasing and financing, Link will also provide insurance services.

Link will become a division of the main holding company for Isher-Woods, Rile Business Systems. This name is being used again for the second new company, Rile Computer Systems (pronounced Rike).

Rile's main task will be a complete back-up for the installation and support of microcomputer systems. This, according to Woods, will include a hardware procurement service, which he describes as holding in stock all necessary hardware components, especially essential items such as connector cables.

Other services offered will be hardware integration, which will include checking out hardware for a week, an installation and commissioning service, systems software support and a maintenance service.

Three levels of maintenance will be offered, ranging from a warranty on all hardware, for 5% of the system purchase price, a 24-hour response service within a 50-mile radius of Luton for 10%.

Small business launch in UK

ANOTHER system is joining the ranks of small business computers available in the UK. It is the Telega 1000 being sold in this country by Sintrom Electronics of Reading.

Based on a Z80 micro, the system incorporates 64K-bytes of memory and a 10-megabyte Winchester disc. In a single box, communication is via a V24 serial I/O ports and a character printer. To back up the disc, the system also incorporates a cartridge tape drive capable of holding all the data on the disc.

In its standard configuration, the Telega 1000 can support three terminals running multi-user Basic. It can support a range of peripheral devices, in addition to the multi-user Basic software, both Fortran and Cobol are available.

Bad luck for Apple

A RUN of bad luck over Christmas left Apple Computer's UK master distributor Microsense with several problems and some unhappy dealers towards the end of last week.

The bad luck started on December 17, when a shipment of Apple IIs and accessories was sent to Microsense by the Cupertino California-based microcomputer manufacturer.

HM Customs and Excise decided to give the shipment what is called Channel Two clearance, which means it is investigated more thoroughly than usual, over a much longer than normal period.

Eventually it was due to be delivered to Microsense on the morning of December 31. That afternoon a delivery arrived, but it was one that had been sent by Apple later and contained only Apple II systems, not the accessories such as RAMs and serial interface cards of which Microsense was by now running very short.

The first shipment was rescheduled to arrive on January 4. It did not make it, however, for the lorry on which it was being carried, having been loaded on Thursday afternoon, caught fire on Thursday night. The insurance loss could be as high as £200,000.

According to Microsense managing director Mike Brewster, Apple responded quickly to getting another consignment into the UK by January 4.

Microsoft moves into Europe

THE US software house Microsoft, producers of probably the most famous standard Basic for microcomputers, has formed a new joint company with Veeva International of Brussels to cover European marketing of its products.

To be called Veeva-Microsoft, the new company will have 50% of the marketing rights in Europe, the UK, Ireland, East Europe and the Middle East.

COMPANY NEWS

Shake-up of GA's Euro operations

THE European side of General Automation was responsible for the pre-tax loss of \$341,000 reported by the company for the first quarter, ended October 31, of its current financial year.

General Automation's acting president, Frank Grisanti, who was brought in last year to deal with the company, announced last month at the company's annual meeting that European operations were being reorganised.

COMMENT

'As you were' for Logabax

One of the first moves has been handing over the management of European operations jointly to Frank Walters and Hank Jarnik. The former Vice-President of Europe, Walfrid Midler, left the company at the end of December. Taking over from Walters as UK general manager is Campbell McGarvey, an ex-Burroughs regional manager.

Grisanti also revealed that certain sales and gross profit figures from General Automation's Austrian sales office had been incorrectly recorded during fiscal 1979 and that, as a result, the financial statement for 1979 had been amended so that profit before extraordinary credit on the financial statements for 1979 had been reduced by \$213,000.

Grisanti mentioned that a major investment banking firm, which he did not name, had been engaged to help place a value on the company so that the board of directors could respond properly to the overtures from several major corporations that were interested in acquiring GA.

Grisanti also referred to the full audit that General Automation had been put through in April before an intended bond offering. Grisanti pointed out that the offering never took place because the underwriters who had contemplated making it withdrew because they believed GA's operating results up to the third quarter of fiscal 1979 could not support the offering.

He also cited the company's chequered history of performance and discussed the major reorganisation that was taking place (CW, September 13, 1979).

Grisanti explained that the reorganising of the company had been suggested by the Boston Consulting Group.

A professional "company doctor," Grisanti was called in last May following a coup staged by the directors against the founder, Larry Goshorn.

He said then that he thought the adjustments in General Automation to put it into a better position for rapid growth would take about nine months, and he believed that his task would be accomplished by mid-February.

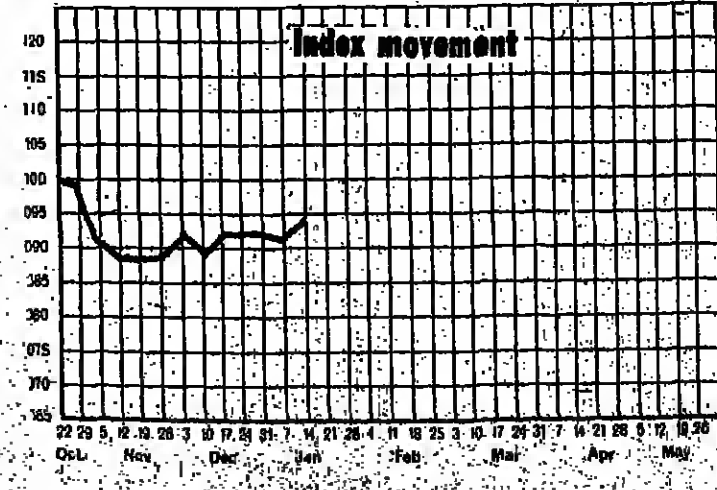
"I honestly believe that the company will have been repositioned effectively for a new leader by that date. Whether or not I continue will depend on prevailing circumstances and need," he said.

In their roles as joint European managers, Frank Walters will handle sales and marketing while Hank Jarnik covers services and engineering. Walters will be responsible for overall operations in Northern Europe and Jarnik will control Central Europe.

COW SHARES TABLE

Date 11/1/80				Index 84.87				Change +2.47			
Price		London Stock Exchange		Price		Price		Price		Price	
High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
840	820	Applied Control Tech	245	+18	175	17	ALL Industrial	175	+18	175	+18
42	41 1/2	Brown Boveri Kent	21	-11	21 1/2	20	Automatic Data Proc	21 1/2	+11	21 1/2	+11
127	124	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
118	114	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
54	52	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
600	548	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
130	123	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
172	168	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
465	407	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
241	238	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
725 1/2	725 1/2	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
485	480	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
95	94	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
212	208	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
234 1/2	231	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
270	268	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
1192	1187	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
1198	1133	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
154	148	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
109	108	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
307	307	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
134 1/2	131 1/2	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
243 1/2	240 1/2	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
1198	1178 1/2	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12
175 1/2	175 1/2	Chubb	73	+12	27 1/2	26 1/2	Computer Resources	27 1/2	+12	27 1/2	+12

The table shows the closing prices in London and New York at the end of last week. The shares listed are based on the prices of the UK companies in the table.



Joint venture

THE previously announced agreement between Modcomp and AEG-Telefunken of West Germany have now been completed. AEG now holds 25% of Modcomp's shares for which it paid \$30 million. Modcomp paid \$2 million for a 25% stake in a new West German joint venture which brings together the Florida microchip maker's West German subsidiary and AEG's process control computer interests.



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Foundries	✓								✓	
Hotels			✓						✓	
Housing Associations	✓								✓	
Insurance		✓		✓		✓			✓	
Leasing and Hire Purchase		✓				✓			✓	
Manufacturing	✓	✓		✓	✓	✓				
Retailing	✓	✓		✓						
Shipping	✓	✓		✓		✓	✓			
Vehicle Contract Hire and Fleet Control	✓			✓					✓	
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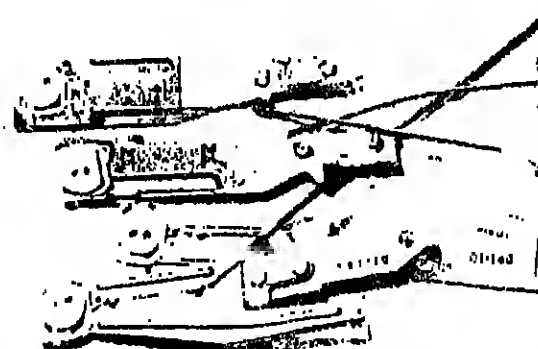
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MICROSYSTEMS

Pointer to future

NOW that Christmas is past, and the ravages of New Year celebrations overcome, it is only proper that the new decade should open with an exhibition dedicated to that potential hope for, and bane of, all our futures — the micro.

Microsystems 80, the first of the pukka exhibitions and conferences geared to illuminating the application and potential of the microprocessor and microprocessor system, starts the year for the third time in succession.

A trendsetter in many ways, it is about to set another, having outgrown the West Centre Hotel in London's West End and moving North to the Wembley Conference Centre.

Opening on January 30, at 9.30 am, it will run for three days, and will again follow the trend set from the start.

This is that the market for micro-based products and applications is extremely wide and transgresses traditional market barriers such as "industrial", or "business and commercial", or even "hobbyist". All are fair game for the micro, as it has already often proved.

Microsystems 80, which is sponsored by Computer Weekly, has managed to reflect that diversity of application, never centring its interest too strongly in any one area.

This year's event will be no exception. For example, in the industrial area where many of the long-term wealth-creating gains should eventually emerge, the exhibition will provide

several stands of considerable interest — particularly so for potential users who can see a market opportunity in their own area, but lack the necessary skills in hardware and software engineering. Microsystems will have several consultancy companies and development systems manufacturers present for such people.

The Sira Institute is an example. This is an independent technology centre specialising in developing systems for meas-

and Bessdale Computer Systems will be in attendance.

The industrial market is a rich area for consultancy companies, and some of them will be on show at Wembley. Hugh Pushman and Associates is one of them. This company offers advice on the application of microprocessors, and assistance with the design and implementation of hardware and software.

On its stand, the company will show its new Futuredata uni-

ment in this area will be Hewlett-Packard, and Ferranti.

HP entered the development systems market towards the latter part of last year, with a multi-station multiprocessor set-up which allows several systems designers to work simultaneously on different projects. This will form the centrepiece of the HP stand at Microsystems 80, though the recently introduced HP-85 personal computer should also make an appearance.

of the computer industry into prominence, starting with the upsurge in the number of shops and quasi "retail" outlets. Among the representatives of this group at the show will be Pet systems specialist Iaher-Woods and a newly-formed company, Interface Components, which specialises in Naecom products.

With software for business microcomputers to a large degree more important than the hardware, Microsystems 80 will have its fair share of companies that specialise in this field. Micro Focus will be present, showing its CIS-Cobol compiler, while Petsoft will demonstrate both its low and high end software packages for the Commodore Pet computer.

Most major suppliers, manufacturers and distributors of systems and hardware will be in attendance, including Comart, which handles Cromeco and Horizon. Research Machines, with its education-based 3802 system, and Commodore with its Pet.

Joining Research Machines as representative of UK expertise in computer systems design and manufacture will be Rair with its Black Box, Trivector Systems and Transdata with its Cx 400 business system.

In the area of peripherals, Comma Computers will show a new range of colour plotters from Brown Boveri, and Anadex a new printer in its range that can operate at 132 or 220 character line lengths.

Ferranti, still the only European semiconductor company to design and produce a microprocessor, the F100-L, will show a development system designed especially for this processor.

Another important sector that will not be ignored is the small business area, where the growth in the application of microcomputer systems has been nothing short of phenomenal.

In its wake this growth has brought a whole new sub-sector

Microsystems 80 will feature three days of conference sessions as an essential adjunct to the exhibition. This year it is being split into three distinct areas, each of which should appeal to most users and potential users, writes CWT Micro News Editor MARTIN BANKS.

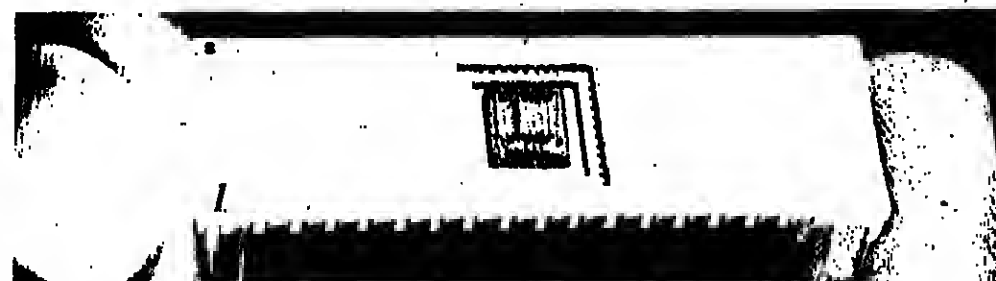
The three are the conference sessions proper, a buyers' forum, and professional development courses.

The conference sessions themselves will, over the three days, cover developments in micro technology and putting micros to work during the first day; system design and specification, plus software and microsystems for the second day; while the third day will be given over to the new traditional subject of personal computing.

The buyers' forum, a new feature this year, will also, over the three days, establish the criteria for the effective selection of hardware and software products.

The one-day professional development courses, a new feature to Microsystems this year, are being organised by Integrated Computer Systems. They provide an introduction to micro and to Pascal for managers and engineers.

For further details and registration information to the conference, contact Business and Industrial Training, Room 814, Dorset House, Stamford Street, London, SE1 9LU.



The only European designed chip, Ferranti's F100-L.

urement and instrumentation. For those seeking the knowledge needed to become proficient in the wonders of microcomputing, the Institute also runs a series of courses.

As part of its showing Sira will demonstrate a gas flow computer, developed in association with KDG Instruments, and a new kit specifically designed for hands-on training.

Training is still a very popular subject and will be liberally represented. Companies such as Integrated Computer Systems

versal development system for microprocessors which can handle a wide range of both 8-bit and 16-bit micros.

The company does not actually sell the Futuredata system in the UK, this task being the work of ISG Data Sales, which will also be exhibiting.

Development systems are a fundamental part of systems development work, especially for the industrial area where software optimisation can be a crucial factor. Two other companies demonstrating equip-

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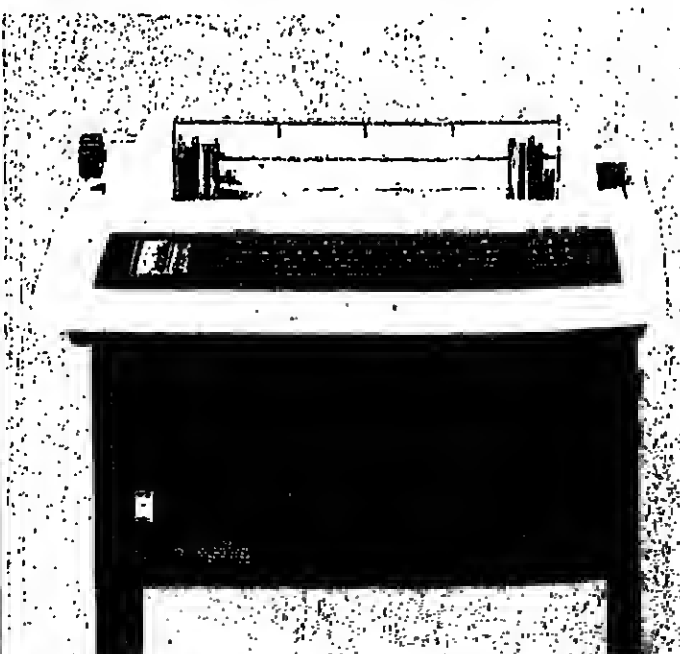
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MICROSYSTEMS 80 CONFERENCE AND EXHIBITION
WEMBLEY CONFERENCE CENTRE, LONDON. January 30—February 1Complex technology
needs new standards

Frank Taylor (pictured above) entered DP in 1955, initially as a digital systems designer and early user of a Ferranti Pegasus computer. He worked with early microcomputers in the mid-1980s and microcomputers in the early 1970s. He spent 11 years at the NCC and formed his own consultancy in 1978 and is also active in the DCS.

AS microcomputers grow up, attention is turning more and more to the systems environment in which they are used, rather than the actual components themselves. This follows the well-established trend in the technical computing and DP fields.

Some 25 years ago there was considerable interest in processors, and indeed one had to be something of an expert to use computers at all.

Today, processing power is taken almost for granted in many cases, and the emphasis is almost wholly on the systems mounted on the hardware and standard software, rather than the standard components themselves.

There are already signs that the 1980s will be the decade of the microsystem — here the word system is used to represent the sum of hardware plus software plus documentation.

Two types of microsystem are emerging as quite different types. The first are dedicated microcomputer systems, the type often found within products. Once programmed, they are normally left well alone since their life is almost certain to exceed the life of the product they are controlling.

In other cases, microprocessor systems may be adjuncts to larger systems or be stand alone transaction processing systems in their own right. In these modes they must necessarily be multi-function systems.

Again, there are already signs that even 8-bit machines configured to form multi-function systems are beginning to compete with, and displace on cost grounds, many of the smaller microcomputers previously used. For example, one such system can support up to 320 megabytes of rotating store linked by nine, or optionally more, 8-bit chips.

As interest grows in systems, rather than hardware and software components, many users are seeking modular hardware and software components which can be rapidly configured into the required form, so that attention can concentrate on systems specification, design and development rather than working with system components such as chips — a time-consuming activity with few rewards.

One of the most interesting developments emerging is that of card-based systems. Such modular systems allow users to select cards from a catalogue — often exceeding 100 different cards, plug them into a bus system which interlinks them, add corresponding and conceptually similar modular software components, and then simply develop and run their target systems.

The approach offers many other advantages, such as maintenance by substitution when a module fails, and relatively easy interworking and open working of such systems via standard bus protocols and systems.

Another very important aspect of microcomputer systems now very definitely falling into sharp focus is the area of collectively to include technical standards, such as communications procedures and protocols, which ease the interworking, interconnection and hence development of microprocessor systems, and procedural standards, such as system

documentation and programming standards, which maximise the benefits gained from human efforts aimed at originating and generating good systems.

The area of technical standards, both hardware and software, will form a review paper during the forthcoming Microsystems 80 conference — the review of hardware standards will start at the grass roots level and look at the environment surrounding chips, and rapidly work upwards to review such areas as bus standards and data communication standards.

The software review will cover status of standards defining the now available languages on micros, such as Cobol, Pascal and Fortran. The brief review of systems standards will look at the so-called "human standards" in perspective, including standards for progressing projects, recording systems work, and programming standards suitable for use in association with microsystems. There will also be a very quick look at adapted structured programming standards.

Such standards taken collectively are most certainly seen as a key element in the future development of microprocessor technology, since they will determine the rate of realisation of the benefits which may result from the application of the technology.

In some ways the microcomputer field is a very different ball game to the data processing and technical computing areas, particularly where micros are dedicated within given units, and effectively form a complex, software programmed electronic controller.

In other cases, where they form an adjunct or replacement for larger computers, the technology is very similar to that used in connection with the larger classes of computer. Hopefully, if standards are applied carefully and sensibly as and when required, some of the problems encountered in the development of the technology of the larger computers will be avoided.

In particular, it is hoped that some of the massive conversion problems will not emerge again. As the technology becomes more complex, it will be more and more important for user organisations to determine a strategy for the acquisition and progression of microcomputer systems which can be applied prospectively rather than retrospectively.

Particular care must, however, be taken not to inhibit development. For organisations not attempting to keep pace with the latest technological developments, the definition of a cross-company strategy covering a forward period of three to five years is already a possibility.

In other cases, when com-

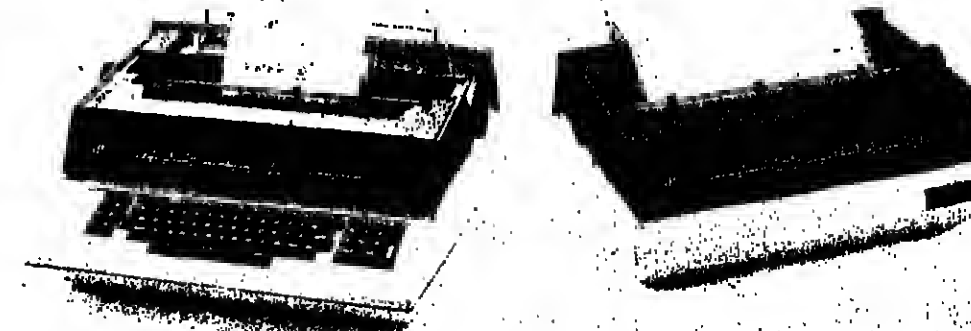
panies are tempted to keep pace with technology, such a strategy becomes in effect a moving target — constantly updated as and when each major advance occurs which must be adopted by the company and incorporated into its policies.

Which of these two approaches should be taken by a given organisation depends very much on the number of microprocessors it proposes to use, whether or not their technology is being stretched and hence advantage must be taken of new

developments as quickly as possible.

Capital invested in strategy studies, and then invested in implementing and monitoring activities to ensure their alignment with a proposed strategy, will be more than simply repaid.

The key to successful microprocessor systems is, in a few words, similar to the key for any successful systems activity — "Proceed carefully, taking all points of view into account, and proceed unilaterally", so that the problems of interworking, interconnection, interchangeability become a de facto part of the systems implemented.

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Age of software engineer approaches

THE development of cheap microprocessors enables computing power to be used in products and processes where previously it has been uneconomic.

Engineers with little or no experience in designing computer based systems (and, in some cases, with no electronics experience either) are now expected to design microprocessors into their company's products and processes.

What are the problems they will encounter, and how do these differ from the data processing problems?

Certain aspects of designing software for microprocessors are different from designing software for "traditional" computers, namely minis and mainframes.

For example, the software for a microprocessor works on its own. There are no operating systems which control the operation of the devices which are attached to the system. In microprocessor-based systems this is done by the software of the user.

A second aspect of software design for microprocessor-based systems is that they work in real time.

This means that the microprocessor must input the data associated with an event, process it and output the result to the devices it controls, within a fixed period of time. The design of real time software requires a high degree of skill on the part of the engineer.

Furthermore, programs must be re-entrant: external interrupts must be processed without losing data from the interrupted routine and the interrupted

routine must pick up where it left off, once the interrupt has been serviced.

So who should design and develop microprocessor-based systems? Engineers, electronics or otherwise will understand the basic electrical and mechanical realities — timing, response times, electrical and mechanical limitations — but may have little software experience.

They will be unable to benefit from the lessons learned over

years? Which signals are generated spuriously by electromagnetic interference, switch bounce and other extraneous noise sources, and which are genuine?

Ideally, the design and development team should, therefore, be led by an electronics engineer and contain an experienced programmer as well as a mechanical or other engineer where appropriate.

The design of the system

method of programming has yet evolved, there are techniques which to a greater or lesser extent can be successfully applied to designing microprocessor-based systems.

These techniques are called "structured programming": they not only result in a better designed product, but also give managers a tool which they can use to monitor the development of the microprocessor based product.

signs and produces is reliable and works under all conditions. It is the acquisition of these skills by engineers that is of vital importance.

Engineers must be trained in these skills: failure to do so will invariably result in the microprocessor based system they build being unreliable, difficult to maintain, over the budget and behind schedule.

In most cases — unless production runs of many thousands

Pascal has emerged as the front-runner and compilers are now available for many micros. So Pascal is the recommended high level language for microprocessor-based systems.

This is not to say that there is no place for assembler languages. High level languages generate more code than the equivalent assembler program. This results in slower execution and the need for more memory.

The design of the hardware involves designing both the computer section (the microprocessor, memory and input/output interfaces) and the interface to devices the microprocessor monitors and controls.

Building the computer section of a microprocessor-based system is not difficult. Microprocessors and their related devices such as ROMs, RAM and input/output latches are devices which are highly reliable with well defined characteristics.

Interfacing the microprocessor to the devices it monitors and controls can be more difficult, especially where the input data is in non-digital format.

To ensure that the data is correctly sampled and read by the microprocessor requires the designer to have a thorough understanding of the interface problems and be able to recognise good data from spurious noise.

Just as the mature sciences of physics, chemistry and biology have spanned the history of biophysics and biochemistry, the fields of data processing and electronics are creating a new type of engineer.

This hero is the VLSI software engineer. In the age of VLSI software engineer.



Jolly

MOST industrialised nations of the world have now accepted the challenge of microelectronics and have responded to it in different ways — from within industry, at a national government level, and from trade unions.

This response can be seen as a reaction to the dominance of Japan and the US in microelectronics and in the products derived from the application of these components.

Japanese and US companies have seen the opportunity, developed the technology and exploited it fully using their abilities in management and in marketing to push their products internationally.

It seems then that most European nations are now reacting to an imposed situation rather than being creative in their own right. Many nations have varying levels of industrial or government-supported interests at present, and in the short to medium term one hopes that such support will significantly strengthen a nation's activities in developing microelectronics.

However, in the not too distant future, and most likely as a consequence of all these national programmes of support, businesses throughout Europe will be competing upon roughly equal terms where microelectronics application are concerned.

We are faced with a dilemma. We are being encouraged to innovate, we may have government money to help us innovate, we have had government money to support research. Similar activities exist in other countries and in due course all nations may still find themselves on equal terms.

The competitive environment will not have changed significantly for those companies using advanced electronics in automation and industry, but the competition certainly will be tougher for those businesses and countries that do not take advantage of new technologies.

During the past two years the vogue of microelectronics and, in particular, the microprocessor has led to an extraordinary debate across the industry. The media has had a field day, reporting the chief pundits in this debate, while training courses and conferences on various aspects of the microprocessor and its effect are ubiquitous.

There are many well worn arguments about the detrimental effects of microelectronics on industry and society, but I suggest that there are many positive points to be considered.

Discussion engenders awareness and hopefully some deeper understanding about the consequences of our actions, onlookers of the technology.

The awareness activity provided by the Department of Industry as part of the MAP project is, in international terms, unusual and interesting and has undoubtedly been of benefit to all of us, in society and in industry, in moving from a general atmosphere of indifference two years ago to an environment

Management must face challenge of 80s

where there exists a desire to be informed about microelectronics and its applications.

The MAP activity includes the provision of awareness courses for managers in industry in general and has the advantage of alerting management to the benefits of one particular area of new technology.

In an ideal world the same managers should really be alerted to the benefits of other developments in a wide range of areas such as mechanical engineering, ergonomics, production engineering and chemical engineering as well as data processing and software technologies.

Part of any awareness activity is to encourage innovation on the one hand and the improvement of older designs on the other. Unions, government and training organisations have been quick to respond to these new challenges and the material produced by these bodies has been of a particularly responsible and informative nature.

However, all this activity centred around the microprocessor has only served to illustrate a fundamental and major weakness in our industrial management structure — its unresponsiveness to technological change in general terms.

Perhaps on the threshold of the '80s we should now be concentrating our efforts on being more responsive to the general aspects of technological change of all kinds.

The fact that the microprocessor pervades all industrial sectors further emphasises this particular point. It is inevitable that such a pervasive new technology is difficult for one sector of industry to understand while easier for another.

The industries to which such new technologies are applied are not only multi-dimensional but also multi-disciplinary. Sadly, it is therefore difficult for management in any industry to fully appreciate all the benefits of any new technology that may be applicable to a company's business.

It seems, therefore, that if we are to make a success of these efforts, to generate new products based on a variety of new technologies (not just microelectronics) then perhaps some attention must be given by management to the adoption of new skills and disciplines as management functions, and to do this as quickly as possible.

Here are some areas worth considering.

Delegation or segregation of technical responsibilities. In some companies, particularly in Europe, there has been a recognition of the importance of specific technologies to some companies. I have seen many firms where, for example, a manager for computer aided design exists, or, for example, a mechanical engineering company's manager for an electronics research group. It is one thing to create such positions but quite another to create them with authority and budget responsibility.

tion of in-house innovative skills. I am sure that in most companies a wealth of good ideas could be forthcoming for new products if the appropriate management skills (including marketing) were applied. An element of in-house training for design staff on product development and company marketing plans may well achieve positive results.

Strengthening of internal R&D. In my judgment some ad-

ditional attention can be given by many companies to appropriate R&D activities, particularly in areas relating to product development, reliability, quality and design. It is becoming all the more important that management positions of authority, again with budget responsibility should exist in this area.

Marketing, sales and new opportunities. To what extent do our British marketing managers really understand in-

ternational markets when they introduce a new product? In many cases products are developed without an adequate look at the needs of the market, or quality requirements and so on. A properly estimated market leads to the introduction of the right product at the right time.

To conclude I would suggest that there are still several companies, large and small that would benefit from careful introspection into their structure

and responsiveness to the new technologies.

Perhaps we should take the heat off the microprocessor and concentrate instead on creating a new vogue for the 1980s. This would be encouragement to management to consider some restructuring to cope with rapid technological change.

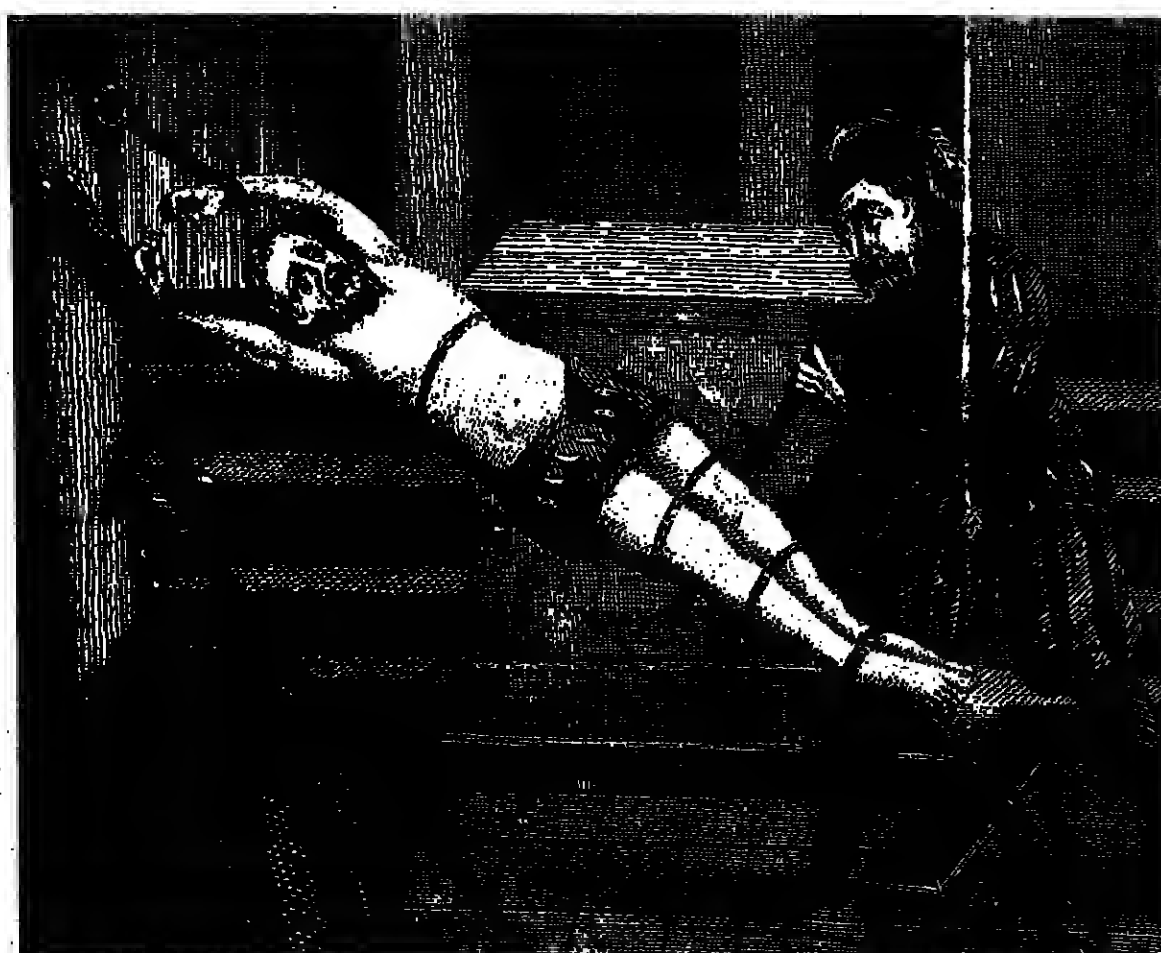
Some of these changes are taking place in industry with good effect. Can it be made to happen faster?

THOUGH the Microprocessor Applications Programme and awareness activities run by the Department of Industry are, in international terms, unusual and interesting, they have served only to illustrate some fundamental weaknesses that exist in the management structures of UK companies.

So argues BRIAN JOLLY, (pictured left) director of Systek Consultants. In this article, The major weakness he cites is the unresponsiveness of UK company managers either to consider or implement technological change in their thinking or products. To overcome this, he suggests that new skills should be included as part of the management function.

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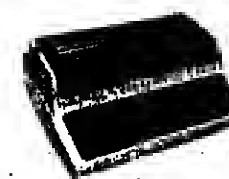
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MICROSYSTEMS

High level of 'integration' a route to better software

WHEN the designer sits down to formulate a system based on microcomputer technology he is faced with a multitude of choices not only of the device to use but how best to approach the design philosophy.

For example, does he need to produce his own boards or does he need to buy in ready-built boards from another manufacturer?

There are various reasons for choosing either approach but it should be borne in mind that the consequences of this initial choice are long-term and affect the whole manufacturing cycle.

It is not intended here to describe the merits of the various microprocessor devices that are on the market, for example the Motorola 6800, Intel 8085A or Texas Instruments TMS 9900.

All these products are well documented and there are numerous articles describing the relative merits of each device — the designer has only to refer to these to make his own decision.

However, there are many more difficult problems to be faced. The first question will be whether to make your own computer boards or to purchase them from component suppliers.

All manufacturers are very helpful and produce single board computers that the user can implement to solve his own problem.

Even assuming that the user



The configuration of a computer system, be it a microcomputer or a mainframe machine, fundamentally consists of two major elements, the hardware and the software.

Here PETER JACKSON (pictured left), technical director of Modular Business Systems, puts forward the idea that by using even higher levels of "integration", board level microcomputer sub-systems built round a standard bus structure, the hardware design problems can be reduced to the point where much more time can be spent on the all-important task of producing the software that makes the total system.

real time and in multiprocessor systems this can be problematic.

Newer designs are coming and emulators are getting nearer to real time.

However, one must never underestimate the task of trying to debug and rectify a malfunctioning processor card. In particular effects due to bus propagation are often ignored in the simplistic design seen in electronics magazines.

But with current processor technology allowing ever-increasing speed, delays due to a bus protocol device can be very embarrassing and systems which work on the limit of a bus specification often exhibit symptoms not unlike intermittent faults.

This can often lead to disaster. To designers not used to working with microprocessors, to whom digital systems either work or don't, the concept of a system working only sometimes can be extremely embarrassing.

Another important aspect is to ensure that there is a second source for the components used. Some manufacturers, who are first out with a device, are often not interested in maintaining production for a very long period, and the second source manufacturers are often the best bet in terms of cost and delivery.

This, of course, may mean that the first design prototypes are very expensive since they are purchased from the original design manufacturer, but later on, costs can come down dramatically.

To sum up, the following points should always be noted:

1. Do I use a standard card?

2. Do I manufacture my own cards?

3. Am I looking for a generalised solution?

4. Am I designing a totally integrated machine?

Only when the designer has totally satisfied himself on each of these points should he proceed.

will often be stuck with the peculiar bus that this manufacturer has designed for his own purpose.

However, they can for one-offs or small quantities, produce effective solutions but one should be careful that the constraints imposed by the buses do not limit future expansion.

One of the microprocessor's great advantages is its cost and therefore multiprocessing systems will become viable. Thus any bus implemented by the designer should be capable of establishing bus interchange protocols between microcomputers.

When reading manufacturers' literature the ease with which products can be interconnected is always stressed; however, it is inevitable that in designing a system it will be found that some particular attribute can only be attained by fairly complex logic circuit design.

Even assuming that the simplistic approach of manufacturer's chips is adopted then with the current trend towards integrating more functions into a single device, the testing and debugging system becomes more complex.

To this end in-circuit emulators, microsystem analysers and so on, are required in order to find, for example, malfunctions in ports. This enables test software to be run through the cards and ports to be examined.

There is, however, one limitation. Most of the current in-circuit emulators attached to development systems are not

designed to implement his solution using the manufacturer's own cards, he is still left with the problem of how to design the entire system concept, since there are many choices and the cost advantages and disadvantages are often not realised until too late.

One of the first problems that must be faced is whether we are designing a general purpose piece of equipment or whether it is a totally integrated system.

If we consider the design of the generalised computer for business use, then we can see several examples of what are called totally integrated designs, for instance the Durango D85 and the Commodore Pet.

These are not designed around a bus structure, or somebody's particular boards, but as a complete unit and thus they appear as such to the user, having little or no expansion capability without the introduction of fairly complex interfaces.

The alternative approach is typified by a company such as Digital Equipment which designs general purpose equipment based on a mass of boards that connect into various chassis. These are usually designed for OEM and purchased by software houses for implementation.

However, this approach can produce solutions which are not always what the user would like. With this approach presentation and software design have to be tailored to suit the particular machine and thus the overall objectives of the equipment are often compromised for the sake of the so-called general purpose design.

Unfortunately, these types of machines are trying to be all things to all men and therefore cannot possibly succeed.

Although quite adequate solutions have been produced in this fashion in the past, the advent of the microcomputer has enabled us to achieve at more reasonable cost, much more in-

tegrated solutions; solutions which do not pretend to be all things to all men but which can be made to produce what the customer wants rather than what the customer wants adapted for a computer system.

This philosophy must affect the internal design of the machine. Thus regarding the choice of bus structure: Whose or what boards should be used? Or should I make my own boards at all? Such questions are seen in a new light by this approach.

It is essential from the design stage that the software and hardware are treated as an integrated unit. The idea of adapting software to fit is often the most disastrous that can be used.

Choice of bus structure for the internals of the machine is a bewildering task. There appear to be two well defined microcomputer bus structures available at the moment.

These are the Intel Multibus and the IEEE S100 bus. Unfortunately, the use of the word "standard" in referring to the S100 is a bit of a misnomer. It has taken some time for IEEE in the US to establish any sort of standard, and the so-called standard bus is anything but.

Each manufacturer has implemented the S100 to suit its particular requirement and has often overlooked the possibility of the customer requiring to use somebody else's boards in its machine.

The Intel Multibus, however, is much better defined but suffers the big disadvantage of being very expensive, besides which Intel is anything but helpful in its encouragement of manufacturers to design their own cards to suit it.

There are a plethora of other buses which cannot be accepted as standard and should the user decide to choose a particular manufacturer's boards, then he



One of the novel ways in which microcomputers can be used is shown at Microsystems 80 by Periscope Microsystems. Called the Na-com, it is essentially a Na-com 2 kit mounted into a briefcase. One of the main aims for its education, which the system's portability makes it easy to move around classrooms.

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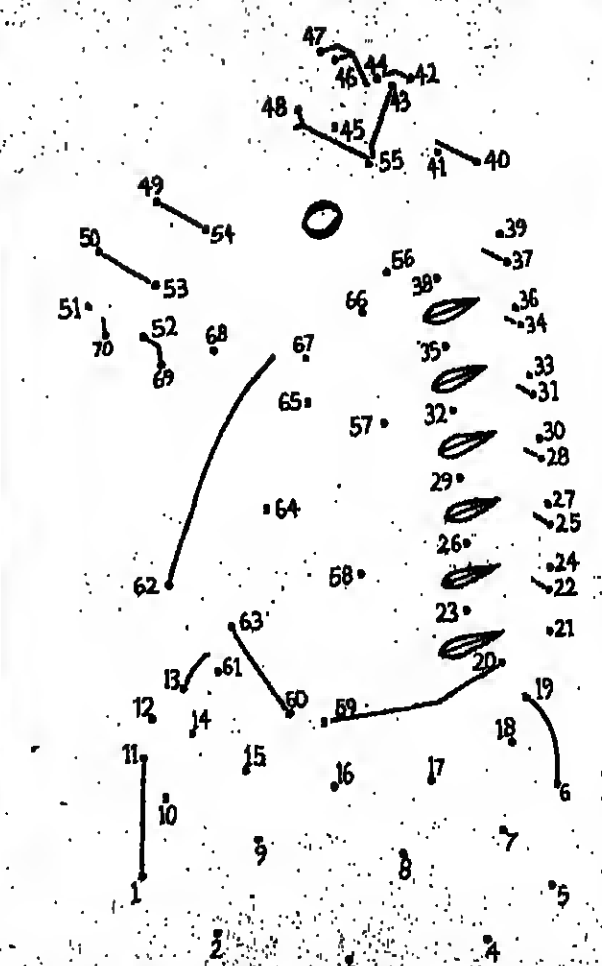
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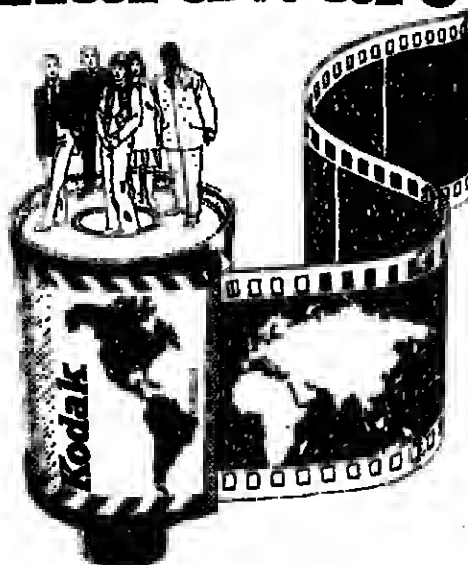
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A major IBM user currently seeks two additional senior systems analysts to work on on-line manufacturing applications. Applicants should have gained 3-4 years general analysis experience. In addition to an excellent salary, the successful candidate can look forward to involvement on the latest data-base techniques.

DERBYSHIRE SENIOR PROGRAMMER

This multi-machine installation is seeking an additional senior programmer who has gained around three years IBM COBOL experience, to work on a wide range of manufacturing systems, including data-base techniques. Salary and benefits package is totally negotiable.

BURY ANALYST/PROGRAMMER

Our client is looking for a 2-3 years experienced analyst/programmer, who has had some involvement with DEC minis using DIBOL. The position will give involvement in a wide range of turnkey systems. This is a varied and highly interesting job in an exciting environment.

NORTH CHESHIRE COBOL PROGRAMMER

Our client currently has 1902T hardware, which will shortly be updated to 2905. A programmer with around 2½ years experience is required to work initially on batch systems whilst receiving on-line training. Excellent salary for the right person in a small, friendly and expanding installation.

NORTH MANCHESTER COBOL PROGRAMMER

Our client is interested in a programmer with around 2 years commercial experience. This position offers an excellent opportunity to join a manufacturing company and receive training on data-base and communications.

Phone STEVE SYKES or GORDON FORBES on LEEDS (0532) 444185 (daytime) or STEVE SYKES on LEEDS 662417 (evenings and weekends) for these or any other NORTH WESTERN vacancies or write with brief details (no stamp required) to Lorien Computer Services, FREEPOST, Leeds LS7 3YU.

LORIEN Recruitment Consultants
OCS House, Servia Road, Leeds LS7 1NJ
Telephone 0532 444185
COMPUTER SERVICES (24-hour telephone service)

SENIOR SYSTEMS ANALYST

Our clients based in Surrey who have in 2900 using CTRIL and FCLA, are seeking to recruit a Senior Systems Analyst with at least 5 years' systems experience in a commercial environment. Must have some supervisory experience.

PROGRAMMING TEAM LEADERS

Large company situated in the City are looking for 2 Programmers who have had at least 4 years' experience with ICL COBOL and have led a team of Programmers on a project. Real time or data-base experience an advantage. Benefits include MORTGAGE Scheme, Non Cont Pension, Free Lunches and Flexitime.

SENIOR PROGRAMMERS/SYSTEMS PROGRAMMER

Large financial organisation based in Central London are looking for 3 Senior Programmers and 1 Systems Programmer, who have had at least 4 years' experience and have successfully completed projects on mini computers, i.e. DEC, DATA GENERAL.

Fringe benefits include cheap MORTGAGE, Personal loans, season ticket loans.

RPG II PROGRAMMERS

We have a number of clients in Central and West London who are seeking IBM RPG II Programmers, with at least 2 years' experience. Plenty of perks including one offering a cheap MORTGAGE.

ICL GEO 2/DME OPERATORS

Major company based in West London require 2 Operators with 10-14 months experience, to be in 2900 machines. This is a challenging installation with good prospects. Fringe benefits include subsidised meals, Pension Scheme, 4 weeks' holiday.

ICL 2900 OPERATOR

Large travel company based in London require an Operator with 8-12 months experience on 2900 machine. Benefits include Free Holiday, LV's, Season Ticket Loan.

IBM OS SENIOR OPERATORS

This is an excellent opportunity for an Operator with approx. 3 years' OS VSI exp. to join a leading financial organisation based in C. London. As standards at this installation are extremely high prospective applicants are expected to be technically competent and fully conversant with JCL and Utilities. Prospects for career developments are excellent and fringe benefits include a MORTGAGE, annual BONUS, LV's and mileage allowance.

IBM OS OPERATORS

12 months' OS experience is a requirement for this City based company utilising a newly installed IBM 3031 under OS VSI. Ambitious Operators will benefit from the outstanding prospects for Management or Technical Support. Sub MORTGAGE, Restaurant and LV's.

IBM DOS OPERATORS

We have a number of clients in and around the London area who are seeking Operators to approx. 12 months DOS exp. Positions are currently available on mid-range IBM 370 hardware at most of our present requirements are for companies installing New Range equipment (4331, 4341, 3031) this year. Shifts and 8 months vary.

Computer Two Thousand

Data Processing Personnel Consultants
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London W1P 9AF
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A Technical Sales Specialist

US Company/European Division/
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Outstanding opportunity now exists for an experienced technical sales person to join a US Company that has recently reorganised to undertake direct marketing of its products.

The primary functions are to market printing terminals and line printers to large volume OEMs. Activities also involve contacts with small OEMs, distributor and occasionally end users. To ensure success in this highly competitive field, the Company is looking for a self motivated imaginative professional with substantial sales experience in Data Terminals, Intelligent Terminals, Computer Peripherals, mini/computer systems, line printers or other closely related products.

Whilst such experience should preferably involve OEM markets, project selling to users of sophisticated small

systems, and communication network equipment are very acceptable alternatives. The successful candidate, male or female, will be articulate and will be able to liaise at every organizational level. Additional languages, while not essential would be beneficial.

A competitive salary will reflect this Company's determination to attract top quality applicants. Career prospects are excellent as would be expected in such a large multi-national Company.

Please write to Mr. S. Smith, A.K., Sales, 20 South Square, London, W1A 1DS, or telephone 01-734 6404 Ext 420 for an application form quoting reference number C/87/75. Companies in which you are not interested should be listed in a covering letter.

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MANAGING PROGRAMMER

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CPA have an NCR V8555M mainframe, and ideally, though not necessarily, candidates will be experienced on NCR computers: knowledge of on-line systems will be useful, and of COBOL essential.

Please write, giving full details of age, marital status, education, experience and current salary to Ian Thomas, Computer Patent Annuities, Union House, Union Street, St. Heller, Jersey, C.I.

EXPAND YOUR EXPERIENCE

A large Pharmaceutical Company situated in West London is currently entering its O.P. Department to handle a major expansion of Development and the installation of a new IBM 4341 in October.

Current Software Systems in use are DL/I, CICS, Power/VS, which will be run under VSE on the IBM 4341. The following staff are required to contribute their ability in organising the new machine.

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You would be responsible for the data control area, which entails the co-ordination of J.C.L. from card to disc, liaison with users, Man-Management of the data control staff, documentation, distribution, job set-up, etc. Knowledge of DOB J.C.L. is essential. Salary will be circa £6200 and other fringe benefits are also available.

OPERATOR DOS/POWER/VS £5500

Every operator's job sounds the same when you read an advert and we are not saying this is different, but what we do say is that the rewards and the environment are much better. For example, you work two shifts: 7 a.m.-3 p.m. and 2 p.m.-10 p.m. The salary is £5500 per annum and on top of this there are FREE MEALS on all shifts, BUPA after pay year, permanent health scheme, FREE life assurance and purchase of goods from the company at a DISCOUNT.

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Contact: Andy Wright

Codasyl Database Design

Holland

c. £18,000 + car

Superb opening for a Database Designer, especially with good experience of DMS 90 or 1100, to join one of the fastest growing specialist consultancies in Holland. Initial project likely to be a DMS 1100 design job, but other types of db/dc design will follow. (TOTAL, IMS, IDMS etc.)

Permanent career position with a true consultancy — excellent salary and benefits.

Contact: Andy Wright

Senior Analyst/Programmer

City

c. £10K + benefits

Our clients are the U.K. subsidiary of one of the major Reinsurance groups in Europe. Having recently installed an IBM System 34, they need an experienced Analyst/Programmer to work with the DPM in implementing the first major system, which will include on-line data entry and enquiry facilities. Further developments and enhancements are also planned, which will entail increasing responsibility for the successful candidate. Knowledge of reinsurance would be useful but is not essential. However, good RPG2 experience on System 34 or System 3 is required.

An exceptional range of fringe benefits is offered, in addition to a very attractive starting salary.

Contact: Bernard Kiernan

Systems Analysts

Nottingham

c. £6,300

A major and diverse company requires SYSTEMS ANALYSTS to assist in the development of a range of interesting commercial applications. In addition to systems experience, applicants should have a good education and at least 2 years programming experience preferably in an IBM mainframe environment.

Contact: Bev Stevens

APL Programmers

West of England

up to £7,000

Our client, an International computer services organisation, has vacancies for APL Programmers to work on the development of commercial systems on micros. Candidates should have two years APL experience, preferably in an accounting/financial environment and the ability to handle client problems.

Above average salaries and benefits.

Contact: Jim Baker

Head of Tech. Publications

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We have been retained to recruit a Senior Technical Publications person to run and control a group of up to 20 staff. The Company are a computer manufacturer producing and selling quality products to all Sectors of Commerce, Industry, scientific and military areas.

Candidates must be very experienced in either hardware or software with a sound familiarity of total systems. A high degree of management ability is also sought.

Contact: Mike Creamer

Analyst/Programmer

Croydon

c. £7,000

Our client, a large international organisation, has immediate vacancies for Analyst/Programmers to join the commercial development teams. Applicants should have at least three years ANS COBOL programming experience on IBM equipment and have had some involvement with systems design, preferably in accounting, general commercial or database applications.

This is an exciting opportunity to work on new IBM hardware with above average fringe benefits.

Contact: Jim Baker

Graduate Programmer

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FINTEL, a joint venture of the Financial Times and Excel, are the leading providers of information to the PRESTEL system. They are now developing information channels into a world-wide on-line network using a PDP 11/03 linked to an IBM 370/148, PRESTEL and other host systems. They need a young graduate with about two years or more computing experience and a working knowledge of MACRO II. Training in MicroCOBOL will be provided.

The selected candidate will be the programming specialist in a multi-disciplinary team, so good communicative skills are essential.

Contact: Bernard Kiernan

JAMES BAKER ASSOCIATES

International Personnel Consultants
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Tel: 01-439 9311

Computer Engineers

£Neg + Car Nationwide

Due to expansion our client, a major computer company manufacturing medium to large computer systems, is now seeking a number of experienced computer engineers to maintain their equipment on customer sites.

The ideal candidates will already have at least one year's experience on MINI or MAINFRAME computers and some practical knowledge of associated peripherals i.e. disk drives, V.D.U's and printers.

A salary of up to £7000 (commensurate with experience) and CAR will be offered to the successful candidates.

If you wish to find out more details about these positions telephone or write to Alan Slater quoting reference AS 3030.

Lloyd Chapman Associates
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Executive Selection Consultants

Group Systems Manager

Thames Valley, c.£11,000+ bonus+car

This Group is a European market leader with a turnover in excess of £40 million, and is currently undergoing a substantial reorganisation to improve profitability. It has several operating companies in the UK with a number of computer installations. The Group Systems Manager will be responsible for the co-ordination of data processing systems throughout the Group including the development and implementation of long term strategies, recruitment of senior staff and hardware selection. The successful applicant will be required to exert a strong personal influence over the individual DP departments and to ensure that the highest professional standards are achieved. Candidates aged 30-38 and educated to at least degree level must show outstanding systems and DP experience gained in a variety of environments. Good communication skills and commercial understanding are essential. Very generous benefits include relocation aid in this pleasant rural area.

G.E. Forrester, Ref: 18255/GW. Male or female candidates should telephone in confidence for a Personal History Form to: LONDON: 01-734 6852, Sutherland House, 56 Argyl Street, W1E 6EZ.

Unequalled in its range of job opportunities

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In order that our Management Services Department can meet the increasing demands of company activities in the commercial, production, and engineering areas, we require additional staff. The department currently operates a dual IBM 370/158 installation, with about 150 on-line terminals supported by IMSDB/DC and it is expected that this figure will rise to 350 during the next 5 years. To meet this increased requirement we need:-

Systems Analysts

with a background of at least 2 years experience in commercial systems, including on-line and/or business experience in an industrial environment at managerial level, capable of developing data processing techniques.

Trainee Analysts

Ideally with a degree or HNC/D in a business or engineering area, who can look forward to good, career development incorporating a variety of interesting projects.

Programmers

with at least 2 years experience, preferably including on-line, who will be working within the application programming section on a variety of batch and on-line systems.

Trainee Programmers

who have attained the minimum qualification of a G.C.E. 'A' level, preferably maths, and/or some D.P. experience.

For all these positions we can offer competitive salaries, attractive conditions of employment, and relocation allowances where applicable. If you are interested you can obtain more details by telephone, or you can write, with particulars of your experience and qualifications to:- Mr. D. Barnes, Ref C083A, British Aerospace Dynamics Group Personnel Department, P.O. Box 19, Six Hills Way, Stevenage, Herts. SG1 2DA. Telephone Stevenage (0438) 2422 Ext 3280

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DYNAMICS GROUP
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If you have the experience we need and value your future, then you and Inatron have a mutual interest.

In keeping with the high standards we maintain, the company is able to offer excellent sterling salaries with four weeks' holiday p.a. and appropriate fringe benefits, which include a non-contributory pension and life assurance scheme. Reasonable relocation expenses will be paid as appropriate.

Please ring the Personnel Department, High Wycombe (0494) 33333 or write to the Personnel Manager, Inatron Ltd., Coronation Road, High Wycombe, Bucks.

Man or woman may apply

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CSL

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OPERATIONS MANAGER

The Client Part of a major U.K. quoted group with world-wide interests. A leader in its sector of the industrial chemical market, with a consistent profit record.

The Job A new post, resulting from a decision to establish an IBM 4300 based computer centre to provide on-line computing facilities to a number of factory and depot locations in the U.K. Reporting to the Management Services Manager and supported by a small staff, the immediate task will be to install the new equipment and develop new operating procedures.

The Candidate A man or woman aged 30-45, with significant data processing experience. Essential personal qualities are good organisation and communication skills and the ability to control and motivate staff.

Assistance will be provided with relocation expenses.

Resumes, which will be acknowledged and forwarded to our client unless a covering letter gives contrary instructions, to E. H. Simpson, Executive Selection Division, Ref. 8835 at the address below.

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Management Consultants
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NW Surrey £4,900-£9,300 p.a.

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The Company operates a sensible career structure. Where applicable, generous relocation expenses will be paid.

Why not discuss the opportunities with me? Initially, get in touch with my office with your address/telephone number. Alternatively, telephone me, any evening, on Burgess Hill 41360.

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Management Consultants
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Don't be caught in the big squeeze in 1980 - consolidate your career with the right move now! Our Clients, a major force in the field of on-line computer services, both in the UK and EEC can offer you the stability of a large, well-organised and soundly financed company, together with the variety, stimulation and individual responsibility found working in small project teams. Current requirements are for a young, enthusiastic Analyst with sales orientation and two COBOL programmers to join the business applications group. Applicants for the Analyst position should have a sound commercial DP background plus good analytical and communication skills for this Sales/Client Support role. Programmers should offer at

least 2 years COBOL experience, have a lively outgoing personality, and the ability to cope when the pressure is really on. Rewards are high: in addition to job satisfaction you will receive an excellent salary plus profit-sharing and incentive bonuses. Matrix will be conducting preliminary interviews during January, after which shortlisted candidates will meet the Company's senior personnel.

Programmers £6-7.5K
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Analysts and Programmers - do you enjoy overseas travel and customer liaison? If you have more than 2 years experience in PL/I, BASIC, RPG, COBOL or Assembler (on minis or mainframes) our Clients, a leading London-based Software House, can offer you the variety and responsibility you have been seeking.

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Reading

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Salaries in the range £11-16K

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£7-9.5K

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To assist with the development of major systems three key managers are sought. Reporting to the Director they will play key roles in the development of a wide range of systems which will all be on-line and database orientated. Initial development effort will be concentrated in the area of on-line COBOL and on-line purchasing systems.

SYSTEMS DEVELOPMENT MANAGER

This position will carry responsibility for all aspects of systems development and will involve controlling a small team of analysts and programmers. Candidates must have extensive experience developing and implementing systems covering manufacturing, distribution and stock control. Experience of on-line systems and database essential and previous experience using IBM hardware and software a decided advantage. (Ref. CW/8002)

OPERATIONS MANAGER

This manager will assume total responsibility for computer operations which will include the provision of a major on-line service. Candidates will have many years experience in computer operations and teleprocessing and it is most likely that the successful candidate is already an operations manager. Extensive practical knowledge of IBM 370 hardware and DOS/VS software is important and experience in establishing a new department in a 'green-field' situation would be advantageous. (Ref. CW/8003)

SOFTWARE SPECIALIST

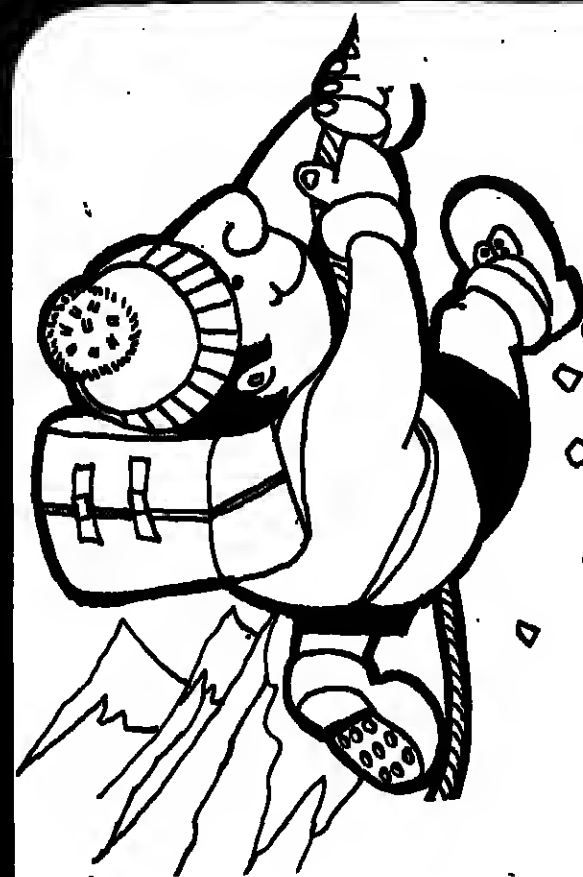
The successful applicant will be a top class specialist responsible for ensuring the most effective use of all available software in this new installation. This is a key position and to be considered candidates must have extensive experience in systems programming in an IBM environment. Specific software knowledge will include DOS/VS (E), CICS/VS and DL/1 at a detailed level. (Ref. CW/8004)

SALARY RANGE £9000-£12000+CAR

Salaries for these appointments will be negotiated in the range shown above and the other benefits, which include a company car and relocation expenses, will more than adequately reflect the importance our client attaches to these positions. Interested candidates should contact Ivor Norton in the strictest confidence quoting the appropriate reference.

Ivor Norton Management Services Ltd

62 Shaftesbury Avenue, London W1V 7DE. 01-734 8867. P.O. Box 53, Copthall Tower House, Harrogate HG1 1TS. Tel: Harrogate 86628. 24 hour answering service (0423) 5531.



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High level SYSTEMS DESIGNER required for our Northern-based client. Immediate start. c£260

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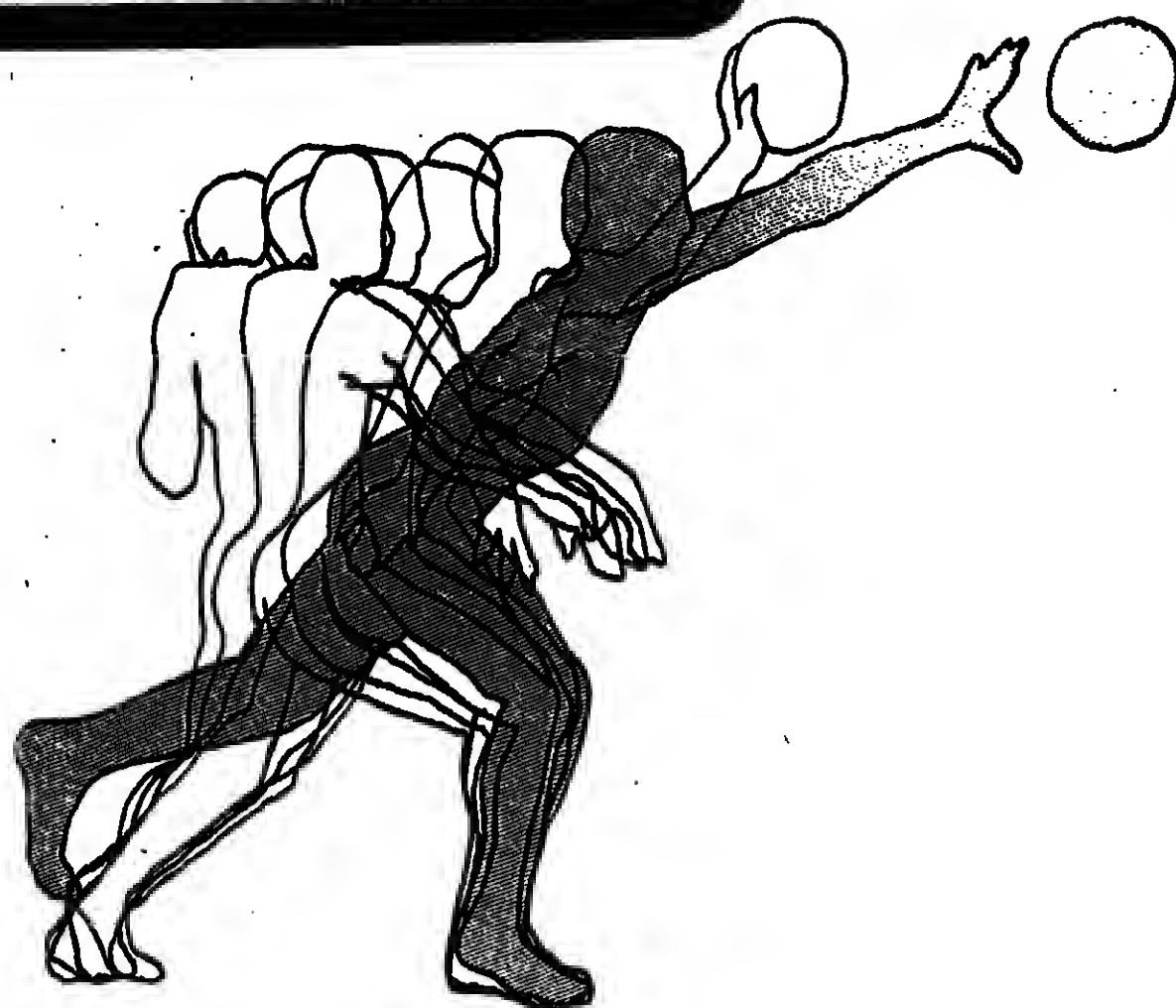
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A salary scale of £8K to £8K p.a. is offered and a company car is provided. In addition there are big company benefits and rapid career progression within a dynamic environment.

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MANAGEMENT & EXECUTIVE SELECTION

JBA

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Thames Valley – near Windsor

£6,500-£11,000

The Company

Our client is a very well established American computer manufacturer, providing modern systems to a variety of business, engineering and scientific organisations internationally. Near Windsor, the Company has its U.K. and European headquarters where development of Systems software and applications packages for world-wide use is undertaken.

The successful release recently of new hardware and software and the increasing demand for the Company's products necessitate further expansion of the dedicated development teams in several technical areas. The Company's success and its salary policy ensure that the work is always challenging and salaries are always among the best offered. If you have what it takes, salary is unlikely to be an obstacle.

Compiler Designers

The Company's emphasis on easy to use systems has many implications for the design of its compilers for the 1980's. Applicants must have some practical knowledge of compiler design, having developed or supported a compiler in the field. If you know that you can design the best compiler, now is your chance to show your ability to apply innovative and creative techniques.

Systems Programmers

The Company's products have features that greatly benefit Systems Programmers – but only a Systems Programmer knows what Systems Programmers need. Opportunities exist to make the transition from supporting manufacturer's system software to actually developing it. Products include data management, on-line transaction processing and general software packages.

Contact: Mike Creamer

JAMES BAKER ASSOCIATES, International Personnel Consultants,
32 Savile Row, London W1. Tel: 01-439 9311.

A new decade!

**UK and European Opportunities for:
Operators, Senior Operators
and Shift Leaders (contract/salaried)**

**Over 30 contracts available now!
System 4; George 2 and 2+; George 3;
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Building on ten years of success, our requirements for top class Operations Staff are continuously expanding throughout the UK and abroad. We have immediate requirements for staff with:

* 2½ years experience * Ambition and dedication

We offer:

* Top rates of pay * Job satisfaction

* Good career prospects * Opportunities for contracts abroad
Find out more by telephoning Graham Whitaker or Keith Poole on Reading (0734) 581258 ext. 36 or 46, or write to us at ICL Dataskil, Reading Bridge House, Reading, Berkshire RG1 8PN, quoting reference CW1584.

ICL Dataskil
The Computer Professionals

CAP Scientific is expanding rapidly and we have produced over £½ million of business in our first six months of operation.

SCIENTIFIC REAL-TIME SYSTEMS

We are looking for programmers and designers who are interested in real-time systems with a distinctly scientific flavour. Our work ranges from dedicated micro-systems to large networks of mini-computers. Most software is written in CORAL 66 and MASCOT is used on an increasing number of projects. We have a number of positions to be filled in our team of consultants and we are specifically looking for skills in:

Interprocessor communications

Design of micro systems Design of displays

Analogue I/O and signal processing

Salaries range from £6,000 to £12,000 and include a profit related bonus. CAP Scientific is a systems consultancy and staff have an opportunity to work on a variety of projects.

We have a formal career development programme to ensure that proper attention is given to your career interests and plans for future assignments leading to promotion. Salary and promotion reviews take place every six months. We have a good benefit package including at least four weeks holiday, a good sick pay scheme, staff mortgage service and a share purchase scheme. Removal assistance will be given where appropriate. We will arrange local interviews where possible.

This could be your opportunity to join us and help build a successful venture. If you would like to apply, please complete the coupon below or telephone, quoting reference number CW19140.

Tony Knott, Recruitment Manager
Computer Analysts and Programmers (UK) Ltd.,
20-26 Lamb's Conduit Street, London WC1N 3LF
Tel. No: 01-242 0021

Name _____
Address _____

Daytime phone no. _____

copy 1/10/80

MYRIAD**D.P. PROFESSIONALS****N.W. LONDON. £6500-£7000**

A major manufacturing and retailing organisation with outlets throughout the U.K. and Europe is seeking to strengthen its Data Processing team by recruiting three professionals to assist in the development of Work in Progress and warehousing systems.

Development will centre around an IBM System 3 Model 15 and will incorporate the use of microprocessors, data capture terminals, light pen readers and other sophisticated equipment.

Candidates will be able to gain considerable experience of batch and on-line applications and to develop their own individual skills in design, implementation and user liaison.

The three key members sought are:

ANALYST/PROGRAMMER c £7000
with 3 years' D.P. experience offering a sound knowledge of RPG II and CCP.

PROGRAMMER c £6500
with a minimum 18 months' RPG II experience together with a good understanding of CCP.

O & M ANALYST/IMPLEMENTATION ANALYST c £6500
with 1-2 years' implementation experience together with procedural writing and forms design. The Institute of Management Services qualification is also desirable.

A good range of company benefits contribute to make these excellent opportunities for progression to the career-minded professional.

Ref. N4/1701 CW

MYRIAD APPOINTMENTS LIMITED
30 Fleet St London EC4Y 1AA Tel 01-353 0981 24 hrs

Telephone Communications

**Sales Opportunities - £8.5K-£10.5K
+ Car**

A highly successful, totally British company is expanding as a result of increasing demand for its computerised telephone business systems and communications products. The success is based upon a positive approach to the market supported by effective technical development that provides an extremely flexible product range using the latest microprocessors.

The expansion has created the need to appoint Salesmen for the Midlands/South West, South of the Thames, the North East and Scotland. The interest in and demand for the advanced products is high and requires a very energetic and intelligent approach to capitalise on the area potential.

These positions provide excellent opportunities for people with a sales background in telecommunications and/or computing. Alternatively, candidates will be considered without selling experience but who are self-starters and have a good business acumen with a background knowledge of the industry. This dynamic group with its own production facilities is poised for considerable expansion and offers an extremely friendly environment for the right individuals.

We want to discuss these opportunities immediately. Please quote CW103-DJ.

CAPP ASSOCIATES  **01-686 9693**
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SO YOU THINK YOU COULD SELL?

We are the leading independent COM Bureau in the U.K.

To cope with expansion we need an additional person for our Sales staff - to be based at Watford.

If you have related experience - either in computing or micrographics - and feel capable of presenting the benefits of COM to prospective users, then this could be one of those rare opportunities to break into Sales.

We can offer a well-paid career in a stimulating environment. The remuneration package includes a high basic salary, a commission scheme, and a company car.

You should offer enthusiasm, drive and the determination to succeed! Interested?

Ring Bill Corbridge on Watford 41387, or write for an application form to:

microgen LIMITED 9 Langley Road
Watford
Herts. WD1 3PS

International EDP Auditor

We are seeking:-

- an EDP Professional with basic accounting knowledge to join our EDP Auditing Group on assignments that cover all EDP aspects of Mobil's worldwide petroleum and chemical operations.

The work involves:-

- review of Systems and Data Processing installations, appraisal of internal controls and operating procedures of computer systems, discussion of findings and recommendations with Senior Management, culminating in submission of reports which must be clear and concise. Other duties include advising non-EDP auditors on implementation of computer audit and retrieval programmes. High standards of performance are expected and the ability to communicate effectively at all management levels is essential.

Candidate (male or female) must be:-

- preferably aged 25-35 with at least six years' experience with large-scale computer equipment and mini-computers; experienced in systems analysis, programming, project management and computer operations; preferably holding university degree. Although a professional accounting qualification is not essential, some experience and training in accounting is necessary.

- single or married without children.

The assignments would be:-

- particularly attractive because of the extensive worldwide travel involved.
- almost exclusively outside the UK, entailing continuous living abroad and travelling between locations.
- more competently completed with a knowledge of French, German or Spanish.
- most helpful in providing the incumbent with management EDP auditing experience for further career progression in EDP or financial management with this worldwide, fully integrated oil company either in the UK or abroad.

We offer:-

- attractive salary package (which includes tax-free overseas premium) plus full accommodation and living expenses (including spouse), life assurance, pension and dependants benefit scheme, home leave.

Please write to C. T. Spalding giving details of qualifications, experience, age and current salary to:-

**Mobil Services Company Limited,
Overseas Recruitment
54/60 Victoria Street,
London SW1E 6QB.**

Mobil Services Company Limited



THE FRASER WILLIAMS GROUP. Our name is well-known and respected in all areas of commerce, industry, government and science.

In 10 years we have become one of today's leading UK computer consultants, with over 200 permanent staff and we are now expanding into North America with offices in Toronto and New Jersey.

Our success is based on two key strengths: skilled, adaptable, ambitious and commercially aware people; and an organisational structure which creates a red-tape free environment in all our virtually autonomous offices.

Our clients include major UK and international companies for whom we provide a wide range of services and specialist skills - from programming to complete turnkey projects, with both bespoke and package implementation on mini, micro and mainframe equipment.

To the dedicated professional we offer variety, exceptionally good experience, training and genuine career development, with an earnings package of up to £11,000.

PROGRAMMERS, ANALYSTS, CONSULTANTS AND PROJECT MANAGERS - with sound experience of any application, equipment or language - contact your preferred location now on the telephone number shown. Or write to Fraser Williams & Co, Port of Liverpool Building, Pier Head, Liverpool L3 1BY.

Fraser Williams

Wider dimensions of experience

FINE ART AUCTIONEERS BURROUGHS PROGRAMMER

LONDON, W1 £5,500 + BONUS

Our Client is the foremost firm of Fine Art Auctioneers in the world with sales of £185M. The 20-strong Computer Department has recently upgraded its Burroughs hardware from a B2700 to a B3700, which supports on-line TD B30s and B80s. The Department is also developing stand alone CMS systems on B80s.

The continued growth and increasing sophistication of the business has created the need for further systems development and the appointment of an additional programmer is crucial to the success of these plans.

You will join a busy department developing interesting applications and will gain useful database and real-time processing experience.

You must have around two years' practical experience of COBOL gained on Burroughs equipment and preferably, you will have a good academic background and a confident outgoing personality, together with enthusiasm and career ambition.

For further information, please contact MARK IRENS, quoting reference CW/1701.

HUTTON EXECUTIVE SELECTION LTD.
HUTTON HOUSE,
HUTTON STREET, LONDON EC4Y 8HR

TELEPHONE: 01-353 7141 (24 HOURS)

Hutton
SPECIALIST RECRUITMENT CONSULTANTS

Sales Consultants Computer Services

the growth industry of the 80's

Up to £20,000 + benefits (no commission)

Throughout the new decade, this country will see an unprecedented growth in the use of computer services. CMG, Western Europe's largest independent computer services company, is destined to lead that growth and our expansion plan relies heavily upon the expertise of our sales team to expand existing markets and develop new areas.

We currently have 13 operating companies providing services to all sectors of industry and commerce. Government and professional institutions within the UK and on the Continent. By the mid 80's CMG expects a turnover in excess of £100 million.

We are looking for experienced Sales Consultants to sell the Company's standard computer systems. There are various methods of operating these systems which can involve the use of some computer equipment in the customers office. The systems include payroll, financial accounting and invoicing. They are well proven, tried and tested services. You should have a good track record in sales, preferably in the computer field although this is not essential, together with an accounting or commercial background.

Salary is reviewed annually on the basis of sales made and is not linked to a commission structure. Unrivalled benefits include:

- ☐ Profit share ☐ Share purchase scheme
- ☐ Free medical insurance ☐ Free life assurance
- ☐ Free pension ☐ Assistance with relocation.

We currently have vacancies in
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Informal Interviews

Find out what makes CMG so special. Ring 01-681 7831 for an appointment or come along anytime between 10a.m.-5p.m. on Wednesday, 23rd January.

The Dickens Room, The Inter-Continental Hotel,
Hyde Park, London W1.

If you are unable to make it then, please phone or write for an application form, quoting ref UK201CW to:

Bobbie Rogers, CMG (UK) Ltd,
Sunley House, Bedford Park,
Croydon, Surrey CR0 2AP.
Tel. 01-681 7831.



Analysts/Programmers

Keep yourself well oiled

Energy and computers are two of the most talked about issues at the moment. Here is your chance to put them together at Amoco and get paid up to £10,000 for doing so.

The vacancies are for Commercial and Technical Analyst/Programmers to work in London for Amoco Europe, the European affiliate of Standard Oil Company of Indiana, a major international oil company. The London Data Centre comprises an IBM 3031 computer, operating under VM/VS/CMS with teleprocessing links to affiliated offices throughout the UK and Europe. In addition, we will install a Perkin-Elmer 3 megabyte 3244 computer in 1980 to handle seismic and geological work with interactive graphics terminals.

A large capital investment programme is underway which includes both North Sea development projects and the installation of a catalytic cracker at our Millard Haven refinery. The resulting increase in sales and our North Sea exploration and production activities have caused additional demands on our Information Services Department which is undergoing a major expansion to service these requirements. New systems are to be developed using the latest computer techniques such as Database and Interactive Computing.

BUSINESS SYSTEMS

The work covers a wide range of activities, including financial, marketing and administration systems for our European affiliate companies. We have several vacancies for Analyst/Programmers, ideally graduates with experience of IBM mainframe, COBOL and MARK IV with the proposed introduction of Database, IMS experience would be an added advantage.

TECHNICAL SYSTEMS

Due to expansion, there are several vacancies for Analyst/Programmers to work within our Technical Systems group working on exploration, production and refining applications. Applicants should have a technical degree and several years FORTRAN experience. Any previous Oil Company or Main Computer experience would be an advantage.

Salaries will be from £6,500 to £9,500 per annum and, in addition, we offer a range of benefits including £624 per annum London Allowance, £1 per day lunch/voucher, contributory pension scheme and interest free season ticket loan.

Please write to Brian McIlintock at the address below supplying curriculum vitae, or telephone or send the coupon for more details and an application form.

Post to:
Mr Brian McIlintock,
Employee Relations,
Amoco Europe Inc.,
33 Cavendish Square, London, W1,
01-406 1555.

Please send me an application form for the _____ vacancy

Name _____

Address _____

Phone no. _____



Development Programmers Extend our lead in Computer Aided Design

Racal-Redac Limited pioneered the development of computer aided design. To-day we are renowned worldwide for our interactive graphic PCB layout system which combines a DEC, PDP 11/34 with our sophisticated software to produce a technologically advanced and 'easy to use' system.

Our success has resulted from our total commitment to advanced development, a commitment that has constantly kept us ahead of our competitors in the CAD electronic design field.

We intend to maintain our lead and are currently developing a range of 'new generation' design systems for a variety of applications and we are confident that we will extend our lead into mechanical design, integrated circuit layout and circuit analysis.

Our future development programme is ambitious and we have vacancies for Programmers at all levels to work in small teams on 'state of the art' development projects.

Applicants (male/female) will hold a relevant degree or HND and will currently be involved in developing user orientated systems preferably using Fortran or other scientific languages.

Redac have recently opened a custom built development laboratory, with excellent facilities and computers used solely for development purposes.



Future expansion at Redac will give rise to excellent promotion prospects and these positions represent an ideal opportunity to become established in one of the most beautiful areas in England.

Please apply with details of age, qualifications and experience to:

Brian Ashcroft
Personnel Officer
Racal - Redac Limited
Newtown
Tewkesbury, Glos. GL20 8HE
Telephone (0684) 294161.

Britain's fastest growing electronics group



Multi-Processor Systems

London Based

Salaries

£7-10K +

- opportunity

The leading Information Services company with 20 years worldwide success behind it is expanding the U.K. project-base in such fields as system technology, communications and applications software and is now seeking systems and software professionals with large mainframe (particularly ICL 2900) or Real-Time mini experience.

- applications

Considerable importance will be placed on any expertise in the fields of: Inter-computer networks — command and control systems — on-line transaction processing — VDU screen formatting — on-line computer graphics in either a programming, analysis or systems design role.

- benefits

Successful applicants will be based in either Central or North West London with possible opportunities in Belgium and Germany. You can certainly expect to demand a substantial salary in addition to a range of top fringe benefits including: interest-free season ticket loans, luncheon vouchers, free BUPA, pension and car schemes, etc.

- environment

You will play an important role in future developments within the autonomous U.K. group which is one of the most dynamic divisions of this organisation which employs 13,000 professionals in 100 offices across 5 continents.

- interviews

Interviews will be held at our client's Central London headquarters and firm offers will be made within 10 days. Please send your C.V. in the first instance to MATRIX who are retained to co-ordinate this recruitment programme.

A challenge for discerning professionals

01-373 3063



10 Grenville Place
London SW7 4RW

Matrix

MYRIAD COULD YOU BE A RECRUITMENT CONSULTANT?

LONDON £7500-£12000

If you are interested in recruitment but do not have the necessary experience Myriad may be able to give you the opportunity to train as a Recruitment Consultant.

As one of the major companies in our field with a well-established professional reputation, we have both the resources and expertise to train you in the skills needed to carry out this challenging and rewarding work.

You must have a background in the computer industry, such as programming, analysis or any sales oriented position. Without this essential grounding you could not be expected to give career advice to applicants or advise clients in major recruitment assignments. Under 35 you should possess the potential to succeed in highly sales oriented situations in which you will have the freedom to work very much on your own initiative.

The wide range of activities encompassed by the work will undoubtedly surprise you. You will also be interested in your training and career development. To find out the answers and much more about the varied and interesting life as a recruitment consultant, contact us to arrange an informal discussion and we will also tell you about the outstanding long-term career opportunities available.

Ref. AW 1/1701

MYRIAD APPOINTMENTS LIMITED

30 Fleet Street London EC4Y 1AA
01-353 0981 (24 HOURS)

DATA INTERPRETER/ COMPUTER OPERATOR

Up to £4,800

The British Gas On Line Inspection Centre has achieved an international reputation for the development of improved methods for inspecting high pressure pipelines. Due to expansion of our service we have recently moved to a purpose-built site at Crumlington, Northumbria.

Computer analysis of the inspection data is a key aspect of the service. A computer operator or trainee is required to operate a range of computing equipment and to interpret signal patterns displayed in chart form on a graphics terminal or on plotter paper.

Applicants should have four 'O' level passes or equivalent. Previous operating experience is less important than the ability to learn and apply interpretive skills in a demanding and important task. Training in equipment operation and signal interpretation will be matched to the experience and abilities of the successful candidates.

Salary within the range £4,113-£4,800

A shiftwork system will be introduced at a later date, and appropriate shift allowances paid.

Please apply, quoting reference OLI/410 to:

B. Munro, Senior Personnel Officer
British Gas Corporation, R. & D. Division
On Line Inspection Centre
PO Box 3, Crumlington
Northumbria NE23 9SD
Tel: Crumlington 713401 ext. 218

BRITISH GAS

On Line Inspection

ICL Operators

British one of Britain's largest computer bureaux, providing a fast and efficient service in commerce and industry. Our 2900 service is expanding rapidly and as an experienced operator, you will have a major part to play in the future of the Company.

Our present 2900 department consists of a 2970 running under VME/81 and a 2903 (running under EXEC16), both providing vital on-line systems for major companies.

We are looking for established operators and Senior Operators with

proven experience VME/81, and preferably EXEC16 for GEORGE II - familiarity with COMMS would also be an advantage.

Salaries, on a 3 shift system, will be guaranteed weekend overtime, will be negotiated, according to experience up to £7500 including shift allowance. Career development prospects are excellent.

To find out more, contact Peter Stroe, Sector Personnel Officer, Baric Computing Services Ltd., Forest Road, Feltham, Middx. Tel No. 01-8901414 ext. 281.

BARIC

An ICL/Berkeley Bank Company

OPS FOR THE 80's

If you want to gain communications and operating systems know-how on a big scale, this installation is purpose-built!

* It's a £1,000,000-plus purpose-built centre due for commission in 1981.

* Hardware includes a recently-installed Univac 1100/80 to be upgraded to an 1100/81 this year and an 1100/82 (dual-processor) in 1982.

* Plus some 76-user terminals, growing to 200 by 1983.

* Plus a number of Univac V77 mini-computers providing a communications network for numerous highly diverse applications.

* And micro-processor technology is already being investigated for future OP expansion.

You will provide a service to a wide variety of user departments as well as providing help and advice to other groups within the division. If you think you are

an operations professional and wish to develop your expertise, then we can offer you a challenging position in an expanding operations group.

Add to that a healthy 5-figure sum, an aside, each year for training, active encouragement of initiative, plus a vigorous policy of promotion from within and you can see there's enough here to satisfy the demands of the most ambitious operations professional.

We need both operators and operations support staff. To qualify — you are a man or woman with at least a year's experience which should include some commercial applications and mainframe operating systems.

If interested, please contact Peter Brown on 01-548 1050, Ext. 3479, or write for further details and application form to Surrey County Council, Computer Services Division, County Hall, Penrhyn Road, Kingston upon Thames.

SURREY COUNTY COUNCIL
COMPUTER SERVICES DIVISION

Sex Discrimination Act

No job advertisement which indicates or can reasonably be understood as indicating an intention to discriminate on grounds of sex (e.g. by inviting applications only from males or only from females) may be accepted unless:

- (1) the job is for the purpose of a private household or
- (2) it is in a business employing less than six persons or
- (3) it is otherwise accepted from the requirements of the Sex Discrimination Act.

A statement must be made at the time the advertisement is placed saying which of the exceptions in the Act is considered to apply.

SOFTWARE ENGINEER

Pfizer Central Research is part of a leading international group engaged in the research, development, manufacture and marketing of a wide range of human medicinal and animal health products.

A Software Engineer is required to join a team of computer professionals working on a variety of database applications and package packages in a scientific environment. Together with a group of statisticians they provide complete computing and statistical services to research division which comprises some 15 people, many of whom are qualified scientists. In-house computer facilities consist of a 11/780 and other PDP 11 computers.

Applicants, male or female, should be able to degree level in computer science or a related subject. Relevant experience particularly in Fortran on PDP 11 computers, will be an advantage.

We offer competitive remuneration, flexible working hours, participation in bonus salary continuance and pension scheme and a flourishing sports and social club. A location within easy reach of Heathrow, Gatwick, Luton, the Kentish country and Continental Europe. Write or telephone for application form.

Pfizer

Mr. G. Marshall
Pfizer Central Research
Remington Road, Sandwich
Kent CT13 9NJ
Tel. (030 48) 3511

SUPERVISOR, DP and Systems

CENTRAL LONDON

Foster Wheeler Petroleum Developments is a Company newly formed to capitalise on the new oil and gas engineering. It is an important part of the worldwide Foster Wheeler Organisation. Its activities will include oil and gas field development, reservoir analysis, feasibility studies, engineering services, project management, engineering and construction. As the Company expands, so exciting opportunities are created. The position is based at the Company's offices in Lower Regent Street.

The Supervisor will help establish the function and eventually control the operation of a Hewlett Packard 1000 mini-computer, other hardware and some communication facilities. He or she will also provide a consultancy and systems support service to the technical and

commercial areas of the Company. You should be educated to degree level with 5 years experience in oil and gas engineering and development of commercial systems development and support. Knowledge of mini-computer and remote bureau facilities would be a decided advantage. In addition you must be able to deal with clients and prospective clients and to sell the Company's services.

We can offer a top benefit package including relocation to the London area, where appropriate. There are real opportunities for career progression in the Company and its operation outside London. Written applications should be submitted to: Paul Arney, Staff Recruitment Officer, Foster Wheeler, Greater London House, Hammersmith Road, London NW1 7ON. Tel. 01-589 1111.

FW

A member of the Foster Wheeler Organisation



PROGRAMMERS ANALYSTS PROJECT LEADERS CONSULTANTS

Isn't it time you changed your job—for a career!

Survival in a career cut-throat is a demoralising business. The longer you leave it, the worse it gets! Working in a progressive career situation is different, it's stimulating, it's rewarding, it's a pleasure not a penance.

Individual needs can vary, but if you are 'up with the art', involved in a wide range of disciplines and applications, utilising a broad spectrum of the latest computing equipment, working in a fast growing business environment with real opportunities for personal advancement, enjoying job and company security with access to comprehensive and ongoing training — you're almost there!

Well, that's the way it is within the Professional Services Division of Control Data — and we want you to prove it for yourself. Come and meet some of our people at an —

Open Night

in our new offices at 179/199 Shaftesbury Avenue, London W2, from 6.00 p.m. to 9.00 p.m. on Wednesday, January 23rd, 1980.

Just arrive anytime, or make an appointment if you wish. If you can't make it on that occasion, give us a call and we'll provide the information you need.

We are seeking self-motivated, creative and profit-oriented people from all levels of Commercial Applications experience in Programming, Analysis, Project Leadership and Consultancy. This could be related to either

MAINFRAMES or MINICOMPUTERS

The jobs are based at Control Data House in

CENTRAL LONDON

commanding starting salaries in the range

£4,500 to £10,500

Please contact Caroline Connaher, quoting reference GMR001, who will be pleased to supply further information.

SMR Technical Support People Ltd.
Victory House,
99 Regent Street
London W1R 7HB
Telephone: 01-734 9776
(After 6pm and weekends 01-437 8229)

GD
CONTROL
DATA

MORE THAN A COMPUTER COMPANY

Peterborough Development Corporation requires a

COMPUTER PROGRAMMER

to join a small team working on financial applications using a Honeywell 62/10.

Salary scale £5,889-£8,429 plus supplement of £10 per month pending competency study. Starting salary will depend on experience and qualifications.

In addition the Corporation offers:
- reimbursement of removal expenses
- rented housing accommodation if required
- flexible working hours
- loans for car purchase

At least two years' experience of COBOL is essential and familiarity with Honeywell GCOS operating system would be an added advantage.

For further details ring Derek Hodge on Peterborough 68931 ext. 382, or write for an application form (returnable by 31 January 1980) to the Establishment Officer, Peterborough Development Corporation, PO Box 3, Toothill Close, Peterborough PE1 1UJ.

Peterborough
Cathedral city — new town

Systems Analyst/ Programmer

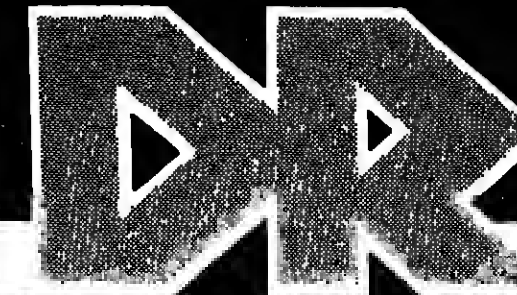
SKELMERSDALE £6000 circa

Our client is a rapidly expanding U.K. subsidiary of a major Company engaged in the marketing and distribution of domestic appliances and luxury kitchen furniture. As part of their continued development they will shortly be installing an IBM system 32.

This will provide a real opportunity for a young Analyst/Programmer to play a major part in the installation and development of computerised systems. The appointed candidate will report to the Financial Controller and work closely with Dutch and German companies. This will initially require frequent overseas visits to other group companies. Terms and conditions of employment are good and success will lead to early promotion. We would like to hear from candidates with 2/3 years programming/systems experience who are looking for a chance to be totally involved with a rapidly expanding business.

Please write or telephone for an application form to:
Bryan Greenwood,
THE JOHN DALTON PARTNERSHIP LTD.,
28 Hagley Street,
Southport PR9 9PD,
Tel. Southport 38776,
after 6.00 p.m. Formby 77371.

THE DALTON PARTNERSHIP
Management Selection & Recruitment Consultants



Programmers

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(DR/377) 18+ months IBM COBOL to £6000
(DR/378) 18+ months ICL COBOL to £6000
(DR/379) 2+ years IBM COBOL/PL-1 to £6000
(DR/380) All Levels ICL COBOL to £6000
(DR/381) All Levels IBM COBOL ASSEMBLER to £6000
(DR/382) 3+ years ICL COBOL Supervising to £7000
(DR/383) 4+ years ICL COBOL/RPG2 to £7500

MANCHESTER

(DR/384) 12+ months ICL COBOL to £5000
(DR/385) 12+ months IBM COBOL to £6000
(DR/386) 18+ months PDP using BASIC £ Neg.
(DR/387) 3+ years IBM COBOL/ASSEMBLER to £7000

LEEDS/BRADFORD

(DR/388) 2+ years COBOL to £6000
(DR/389) 2+ years Honeywell Experience to £5500
(DR/390) 2+ years ICL 1900 COBOL to £5500
(DR/391) All Levels PDP BASIC Experience to £6000
(DR/392) All Levels ICL 1903 (GEORGE III) to £6500
(DR/393) All Levels ICL 2900 (VMEB) to £6500
(DR/394) 2+ years NCR COBOL £ Neg.

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(DR/395) 2+ years IBM COBOL Supervising to £5500
(DR/396) 2+ years ICL COBOL to £6000
(DR/397) 2+ years IBM COBOL/ASSEMBLER to £6250
(DR/398) 2+ years ICL 1900/2900 COBOL to £7000

TYNE & WEAR

(DR/399) 3+ years CICS experience to £8000
(DR/400) 12+ months IBM COBOL experience £ Neg.
(DR/401) 3+ years PL/1 or IBM COBOL to £6500

Analysts

LIVERPOOL

(DR/402) 2+ years ICL Business Experience to £6200
(DR/403) 2+ years IBM Commercial Systems to £6300
(DR/404) 3+ years IBM Environment to £6500
(DR/405) 2+ years (plus Programming Background) to £7000
(DR/406) 2+ years Business Experience £ Neg.
(DR/407) 18+ months Systems/Applications £ Neg.

MANCHESTER

(DR/408) 2+ years IBM Environment to £6000
(DR/409) 2+ years General Business Experience to £6600
(DR/410) 2+ years Retail Environment to £7000
(DR/411) 3+ years General Systems Experience to £7250

LEEDS/BRADFORD

(DR/412) 4+ years (including programming background) to £7000
(DR/413) 2+ years IBM Business Environment to £6000
(DR/414) 2+ years Retail Environment to £6600
(DR/415) 18+ months Commercial Business Experience to £6750

SHEFFIELD

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1980

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Which is where you and the IBM 3033 come in. The IBM 3033 came in just a few days ago. It shows just how far we're thinking ahead here at Tesco. But then when you're running a \$1,236.9 million turnover operation employing some 60,000 personnel at 560 stores and superstore locations throughout the UK, the development of advanced computerised retail systems is vital.

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More specifically, we're after Systems Analysts and Cobol Programmers with at least one year's solid experience in their respective fields.

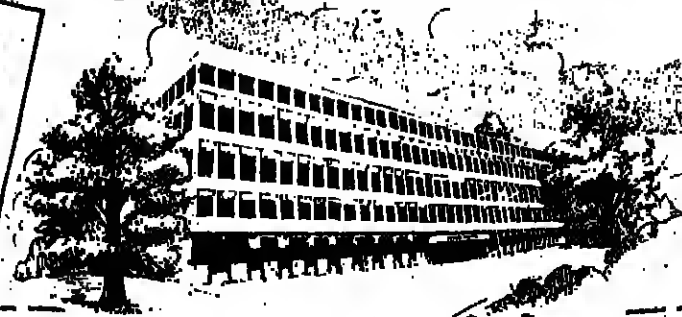
3

In return for your skills you can expect good pay and excellent working conditions to match your outstanding prospects. Analysts can expect to earn from £7,000-£10,500, and Programmers and Consultant Programmers from £6,000-£10,000 per annum.

Working at our Cheshunt, Herts Computer Centre has its very real pleasures too. The location is pleasantly rural, the offices modern and well appointed—and Tesco attend to your every need with a superb subsidised staff restaurant and an active Country Club with many sporting and social facilities. The usual large company benefits also apply and should you need to move house we will pay your relocation expenses.

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Contact Sue Horner, Senior Personnel Officer, Tesco Stores Ltd., Delamare Road, Cheshunt, Herts, EN8 9SL. Telephone Waltham Cross 32222.



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CW/17/80

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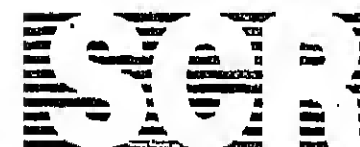
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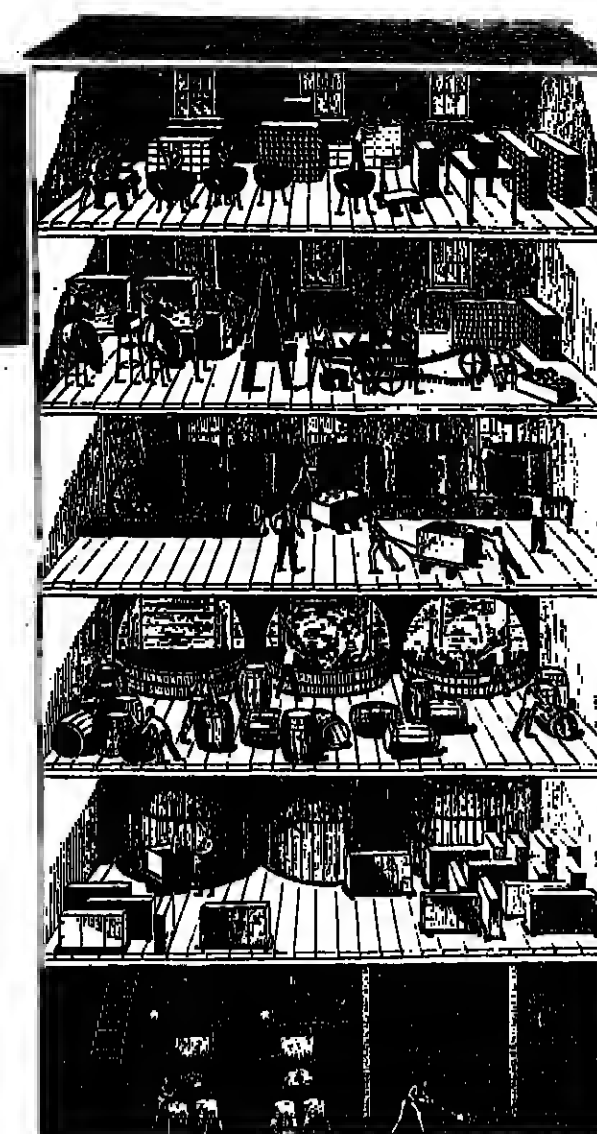
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If you prefer, please write to me enclosing curriculum vitae at my Birmingham Office.



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BOEING COMPUTER CENTRES



ENGINEERS- FINITE ELEMENTS

Boeing Computer Centres is currently launching its EKS service in the UK. EKS uses Control Data computers and currently consists of eight Cyber 175's front-ended by four IBM 3031's. The power of the system will be enhanced during 1980 with the addition of a Cray 1 to the complex.

This installation which is one of the largest collections of Control Data equipment in the world is accessed via the Boeing Interactive telecommunications network and provides both interactive and batch access from the UK.

BCC is looking for engineers with experience of finite element techniques to work with its prospects and customers using the software available on the EKS system. The structural programs available include NASTRAN, MARC, GTSTRUDL, and ANSYS. In addition EKS has extensive graphics, statistical, linear programming and data base software available.

The vacancies are available in our London, Euston office. Salaries will be commensurate with experience and a company car will be provided. Applicants should have at least two years' experience of using finite element techniques. Ideally using NASTRAN. Additional training will be provided in the United States.

Telephone or write for an application form to Pauline Timberlake at Boeing Computer Centres Limited, Mainstream Division, St Martins House, 31-35 Clarendon Road, Watford WD1 1TA, Herts. Telephone Watford 38321.

PROGRAMMERS- SOFTWARE MONITORING

SARA—System Analysis and Resource Accounting is a software performance monitor written and marketed by Boeing with versions available for large scale IBM, Univac and Honeywell machines. SARA recreates the system load at any point in time from the SMF or similar data and then analyses this simulation to provide reports on activity levels of the hardware, tape drives, disk spindles, channels, terminal ports etc, also on the activities of programs and program steps. Output can be in the form of both tables and bar charts.

Different measures of system performance are available to understand better the workings of the machine from the financial and operational points of view.

We have a vacancy which could be either in our Watford or our London, Euston offices for an experienced IBM programmer with an interest in performance monitoring. A good knowledge of JCL is necessary and training on the SARA product will be provided, probably in the United States.

Salary will be commensurate with experience, and there are the normal large company benefits.

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The Company
Our Client is proud to be an AMERICAN International Company. Established in 1967, they have progressively grown to be one of the leading and most successful Management Information Companies in the world — and provide a unique interactive Data Processing service to the 12,000 businessmen that use it daily.

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Their commitment to the future is substantiated by the vast sums being spent on new and exciting developments that will further consolidate their leadership in this and other buoyant sectors.

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1. You should have had extensive customer/prospect contact
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3. Outgoing personality
4. The knowledge of computer applications and their effect upon the end user
5. You need to be fully aware of the decision making processes within large Companies
6. Above all you must be a professional



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With the emphasis on training, career and personal development you will have every opportunity to reap the high rewards from the effort invested with all the backup and help you will ever need. Apart from an OUTSTANDING BASIC SALARY and ON TARGET EARNINGS there is nothing to stop you from joining the growing number of Sales Executives that win trips to such places as Hawaii.

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The company specialises in engineering/electronic projects and their services range from operational research and management consultancy through project appraisal to final implementation. Customers are typically in oil/gas production, industry, defence and communications; therefore job-interest does not prove a problem for their employees. Located in the attractive countryside of Surrey, the modern offices are very accessible by road and rail routes.

REF: S1/1701

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A leading manufacturer of consumable products with an enviable record of growth requires a project leader with Business Systems experience based around IBM and MINI equipment. You will be preparing terms of reference and ensure that all projects are completed on time. Excellent scope for initiative and relocation expenses will be offered to the right candidate if needed. CW 3/8

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S.E. ENGLAND. £5,000-£9,500

I bet you never knew how popular you were! We now have over 35 registered vacancies for BASIC and BASIC + programmers. Opportunities exist in the City, SE1, Bantford, Chatham, Amersham, Kingston, Pinner and Maidenhead for people with 1 1/2 years' or more experience. Career growth is assured and most offer very attractive perks. CW 3/7

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Ask for Tricle, Irene, Christine or Michael

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A major force in the Software market place requires a top grade professional with a minimum of 8 years' experience who wishes to lead a team of people developing mini and mainframe real time systems. The work will be challenging but the rewards are high and there could be a chance of further promotion in a short while. Please apply to Michael Pepper in the strictest confidence. CW 3/8

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LONDON & HOME COUNTIES

£8,000-£9,500
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The Department of Computer Science requires a programmer to join a small team within the department and to have special responsibility for the department's program advisory services.

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Salary will be on the Programmer Grade B scale £4,152-£6,037 (bar) — £6,891 (further increase 1.4.1980), plus £740 London Allowance.

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Required to join a small team doing system and application programming work. An important part of the work is providing advice to students in areas such as packages, languages and system utilities, etc. The range of disciplines within the College is diverse and provides a stimulating and interesting environment for professional software staff.

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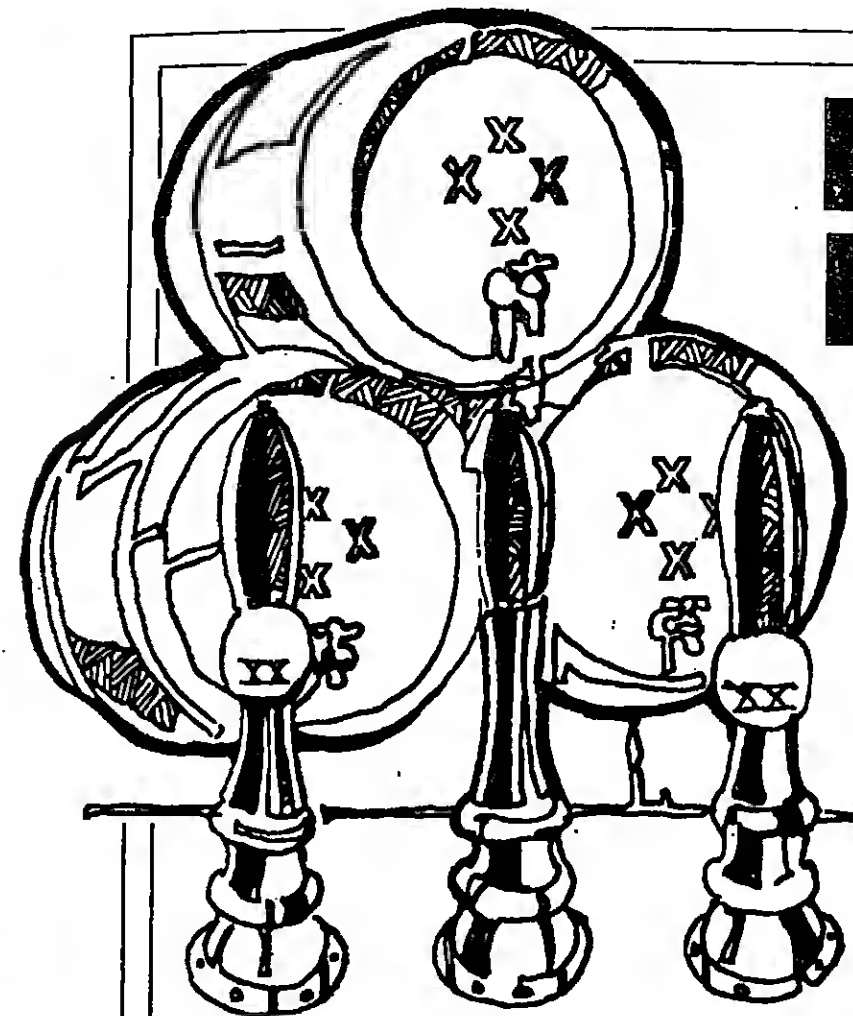
To: Garrick Fraser, Honeywell Information Systems Ltd., Honeywell House, Gt. West Road, Brentford, Middlesex

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The starting salary will be up to £6,500 and there is a profit-sharing scheme in operation.

If you are interested in this vacancy, please write enclosing full curriculum vitae to:

Miss S. E. Bird, Personnel Officer
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We offer attractive conditions of service including: in appropriate cases, 100% removal expenses and travel fees for house purchase, lodging and subsistence allowances. Temporary housing may also be available.
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Are you prepared to relocate in UK? ☐ Abroad? ☐ (tick box)

Experience Place no. of years in box, e.g. IBM 360/370 4

Machines: Please specify model.

IBM 360/370 ☐
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ICL 1900/2900 ☐
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Minimum salary £ _____ Notice required/Date available _____
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Cut out the whole advertisement and post to the address below.

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1. The development and documentation for commercial application of scientific programmes resulting from various on-going research projects; and
2. Investigation of appropriate hardware-software interfaces which will allow groups of microprocessor based development systems access to common facilities on a multi-user basis.

The actual assignment will depend on the experience and interests of the successful applicant and registration for M Phil may be possible.

The appointment is for two years (carrying a fixed salary of £4100 per annum) and will provide valuable training for further work in associated fields.

Applications are invited from graduates holding (or expecting to obtain shortly) either a degree in computer science plus some experience of engineering programmes, or a degree in engineering or physics with a good knowledge of Fortran programming.

Application forms may be obtained from the Staffing Office, The Hatfield Polytechnic, PO Box 109, Hatfield, Herts AL10 9AS, or telephone Hatfield 68100, extension 309.

Please quote ref. 329. Closing date: 1 February, 1980.

Hounslow

(London Borough of)
EDUCATION COMMITTEE
Education Office, Civic Centre, Lampton Road, Hounslow, Middlesex TW3 4ON

Required for:
SUMMER TERM or 1 SEPTEMBER 1980

PERIPATETIC ADVISORY TEACHER OF COMPUTER STUDIES

(Senior Teacher Scale)

A teacher with substantial recent experience of teaching computer studies in secondary schools is required. The person appointed should be prepared:

- (a) To advise on the choice of syllabus, its introduction and to devise effective and efficient teaching schedules.
- (b) To co-ordinate the bench processing and computer terminal work in schools in the Borough.
- (c) To help teachers faced with technical and other problems in the use of these services.
- (d) To organise the in-service training of teachers who wish to teach Computer Studies.

LONDON ALLOWANCE £327 PAYABLE
CLOSING DATE: 1 FEBRUARY, 1980

Further particulars and application forms are available from the Director of Education, London Borough of Hounslow, Civic Centre, Lampton Road, Hounslow, Middlesex TW3 4ON, to whom they should be returned by the closing date. (Postmark stamped envelopes, please.)

The Education Committee has power to consider applications from experienced teachers for assistance towards removal, disturbance or separation expenses.

A. GROVES, Director of Education

DE HAVILLAND COLLEGE
The Campus
Welwyn Garden City
Herts.

**DEPARTMENT OF
COMPUTER STUDIES**
(Borehamwood site)

LECTURER II

Data Processing and Programming in Cobol, required as soon as possible. Commercial programming experience desirable. Duties involve lecturing, student selection, testing and interviewing, industrial consultation and liaison. Some personal consultancy work may be continued by arrangement.

LECTURER I

Computing. To join a lively team and teach programming and operations on full-time and adult training courses, with a strong vocational bias. Both full-time and part-time applicants would be welcomed. The College computer (NCR Century 20) is at Watlington Way, Borehamwood site.

Assistance with removal expenses in approved cases.

Forms and further details from the Principal at the above address (Telephone: Welwyn Garden 28618, ext. 21).

XENOTRON

DEVELOPMENT PROGRAMMER

With specific experience and ability with DEC LSI-11 and/or Z80 or INTEL 8080 microprocessors.

We are a small company, manufacturing a special purpose area composition terminal used world wide by the printing/graphics art industry - based around a DEC LSI-11. We also produce intelligent peripherals using DEC LSI-11 and Z80 microprocessors.

This position offers scope for personal development and foreign travel (Europe and USA), combined with the satisfaction of working for a small closely knit company situated in a very pleasant area of rural England.

Please write or telephone for an application form to: Miss Lorraine Theobald, Xenotron Ltd., Vince Road, Diss, Norfolk IP22 3HH. Telephone (0378) 461172.

NEW YORK → £19,000

Permanent career opportunities for all levels programming personnel (40 vacancies) located in New York City.

SENIOR PROGRAMMERS SYSTEMS ANALYSTS PROJECT MANAGERS

So if you have:

IBM, NCR, HONEYWELL, DEC mainframe experience and any

PLI, BASIC, COBOL, FORTRAN or ASSEMBLER

knowledge then our client who is interviewing London, after the 26th January, 1980, would like an informal talk with you in tell you about the many benefits for single and married people in the USA.

Phone Robert Lavelley for an application form - send your CV - NOW.

Computer Two Thrusand
21-218 International Court Road
London W11 4AT
Tel: 01-636 7584 (24 hrs)

TECHNICAL SALES EXECUTIVE DATA ENTRY SYSTEMS

A young vigorous and expanding company marketing micro computer controlled data entry systems requires a technical sales Executive to promote the company's products to Computer Service Bureau Operators.

Technical sales experience and knowledge of data processing are essential and experience in data transmission systems is desirable.

Excellent remuneration package and growth with this ground-floor appointment.

Applications in writing to—
Managing Director
MICROCOSMIC SYSTEMS LIMITED
5/7 Telford Way
London W3 7XE

CHIEF OPERATOR
MIDDX. £25000
The company is seeking a Chief Operator for its new computer system. The successful candidate will be responsible for the day-to-day operation of the system and will be required to have extensive experience in the field of computer operations.

OPERATIONS SUPERVISOR
MIDDX. £20000
The company is seeking an Operations Supervisor for its new computer system. The successful candidate will be responsible for the day-to-day operation of the system and will be required to have extensive experience in the field of computer operations.

SENIOR OPERATOR
MIDDX. £18000
The company is seeking a Senior Operator for its new computer system. The successful candidate will be responsible for the day-to-day operation of the system and will be required to have extensive experience in the field of computer operations.

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MIDDX. £18000
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SHIFT LEADER
MIDDX. £16000
The company is seeking a Shift Leader for its new computer system. The successful candidate will be responsible for the day-to-day operation of the system and will be required to have extensive experience in the field of computer operations.

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MIDDX. £16000
The company is seeking a Shift Leader for its new computer system. The successful candidate will be responsible for the day-to-day operation of the system and will be required to have extensive experience in the field of computer operations.

OPERATOR
MIDDX. £14000
The company is seeking an Operator for its new computer system. The successful candidate will be responsible for the day-to-day operation of the system and will be required to have extensive experience in the field of computer operations.

OPERATOR
EAST LONDON. £14000
The company is seeking an Operator for its new computer system. The successful candidate will be responsible for the day-to-day operation of the system and will be required to have extensive experience in the field of computer operations.

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How to beat the bush telegraph

You can't possibly cover all the job advertisements by yourself.

And what about all those jobs that are never advertised, because other good people hear about them first?

You miss out.

Break into that closed circle by enrolling with Lansdowne. We'll pump your career details onto the desks of senior managers at thousands of companies - except those who ask us not to approach.

They'll consider you for the immediate jobs and they'll have you on file for the future.

When they want you they'll ring you - not us - and you're immediately short listed for a job you might never have heard about.

Just fill in the coupon and send for our Summary Form and explanatory leaflet.

And do it at once because it's the only one that's worth thousands of applications.

Stuart, Tel: Lansdowne Appointments Register, Design House, The Mall, London W6 6LS.

Tel: 01-578 2262 (24 hour answering service)

Our clients would like to meet men and women, aged 20-40, earning between £4,000-£9,000 in any of the following categories:

SYSTEMS ANALYST PROGRAMMER

Mr/Ms/Ms/Ms

Address _____

Stuart, Tel: Lansdowne Appointments Register, Design House, The Mall, London W6 6LS.

Tel: 01-578 2262 (24 hour answering service)

PROGRAMMING TEAM LEADER
MIDDX. £25000
The company is seeking a Programming Team Leader for its new computer system. The successful candidate will be responsible for the day-to-day operation of the system and will be required to have extensive experience in the field of computer programming.

SOFTWARE PROGRAMMER
MIDDX. £20000
The company is seeking a Software Programmer for its new computer system. The successful candidate will be responsible for the day-to-day operation of the system and will be required to have extensive experience in the field of computer programming.

SENIOR OPERATOR
MIDDX. £18000
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MID GLAMORGAN COUNTY COUNCIL County Treasurer's Department SENIOR PROGRAMMER

£5,220-£6,080 per annum
(Pay Comparability Study Pending)

The Authority has taken delivery of an ICL 2972 computer and a Senior Programmer is required to join one of a number of project teams actively working on the transfer of systems to this machine.

Applicants should have a minimum of two years COBOL experience in a George 3 or VME/B environment. Commencing salary is dependent on qualifications and experience.

Benefits of working with the Authority include:

- * Located in centre of Cardiff with easy access to shops and public transport.
- * Flexible working hours.
- * Experience of 2900 computers.
- * Contributory pension scheme.
- * Generous scheme for payment of lodging and disturbance allowances and removal expenses.
- * Subsidised canteen facilities.
- * National conditions of service.

Application Forms (to be returned by 4.2.80) and further particulars are obtainable from the County Treasurer, Mid Glamorgan County Council, County Hall, Cardiff.

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**Complete the coupon and return to
Effectia Gravis at the address above,
for your next PERMANENT or CON-
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Areas Preferred First Choice _____

Second Choice _____

Experience to date: (Last Position First) _____

Company Name From To _____

and Location Mth / Year Mth / Year Duties and experience _____

Programmers Dual 2976

COBOL PROGRAMMERS male or female with a minimum of 12 months experience are required to work on a wide range of systems, both commercial and engineering. Salary up to £7,480 per annum depending upon experience.

EXCELLENT OPPORTUNITIES FOR PROMOTION.

We have always been to the fore-front in computing, and intend to stay that way.

For an application form telephone 061 634 8181, Ext. 78, completed forms to be returned to The Secretary, Norweb, Chastwood Road, Manchester M8 8BA by 31st January 1980.

norweb

WOOLWORTH

MINI COMPUTER OPERATOR

We are looking for a smart, intelligent person who has held a minimum of six months experience, working in a data processing environment. From our Head Office in Marylebone Road, we operate a V/A mini-computer for data capture, which has communication links to our mainframe computer system in Rochdale and Salford. Successful applicants should be prepared to work on their own initiative as well as under the close supervision of those responsible for the system. We offer the usual range of fringe benefits including a large pension scheme, company car, and other facilities. For an application form, please contact: Mr. B. Woodcock, Woolworth & Co. Ltd., 100, Tottenham Court Road, London W1P 8LJ. Tel: 01-583 1982 for an application form.

RECRUITMENT CONSULTANT

Earning potential in excess of £10,000 p.a. + car

Datascene is one of the most successful recruitment Consultancies operating in the DP field.

We are looking for a consultant to join our highly successful team thus expanding our service to clients even further.

You will work closely with clients on all aspects of recruitment from job identification, giving advice on advertising, writing copy, interviewing and personnel selection.

You should be 22+ professional in approach and have a proven track record in DP. You will ideally be used to dealing directly with clients at all levels up to Senior Management.

This coupled with sound business sense and capacity for hard work should put you in the £10,000 + bracket within 1 year.

We offer an attractive salary package plus a company car after 6 months.

Please contact Mike Dauncey to arrange an interview on either of the above appointments on 01-439 1856

Datascene Recruitment Ltd
Septre House
169-173 Regent Street
London W1R 7FB

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24 hour answer phone

REAL-TIME PROGRAMMERS

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£ DEPENDENT ON LOCATION

Take advantage of our position as one of the leading recruitment specialists in the field of scientific programming. Today, more than ever, there is a demand for highly-skilled personnel with the ability to tackle wide ranging projects in the design and development of scientific computer systems. If you hold a degree in a scientific discipline or have relevant practical experience of real-time mini computer systems, using either ASSEMBLER, BASIC+, MACRO II, CORAL or FORTRAN, then give Mike Howard a ring on the above number.

HOLLAND, GERMANY, BRUSSELS, IRELAND SWITZERLAND

Based in convenient locations throughout Europe are a choice group of Blue Chip companies requiring expertise in any of the following or associated areas.

REAL-TIME COMPUTER SYSTEMS — COMMUNICATIONS
SCIENTIFIC/TECHNICAL — BASIC SOFTWARE DEVELOPMENT
COMMERCIAL BUSINESS SYSTEMS

For further details please contact Eddie Howard.

Edmund Howard & Partners

8 BRIGHTON ROAD, SURBITON, SURREY, ENGLAND. TEL: 01-399 9183

Computer Personnel Consultants

CONTRACT SALES CONSULTANT

Earning potential in excess of £16,000 p.a. + car

We are looking for a person with a DP background who has the ability to succeed in a sales environment to join our team of consultants. Ideally you are working in a client contract situation at present.

The contract market is hard and highly competitive. You will need to be resilient, resourceful and extremely self-motivated. In return we will offer you relevant training and support, an attractive salary package, plus a company car and an opportunity to develop your own area within our fast expanding organisation.

You will have your own area to find job requirements and negotiate contracts with clients.

Computer Systems Salesmen

£9,000-£12,500 + car

NORTH-EAST AND SOUTH-WEST ENGLAND

Hewlett Packard is a large successful International Electronics and Computer Company employing over 50,000 people worldwide.

Our Computer Systems Group currently need to recruit salesmen for the North-East of England to sell Desk Top and Technical computer systems into the manufacturing industry.

We also require salesmen in the South-West based at our Winners offices to sell our range of commercial computer systems.

Applicants aged 23-35 should have a degree or equivalent qualifications in Computer Science or related technical discipline and ideally relevant sales experience. We will consider those who do not have sales experience but who have a thorough knowledge of the computer industry.

Besides a salary between £9,000 and £12,500 including commission we offer an excellent benefits package including:

- * Twice-yearly cash profit sharing
- * Christmas Bonus
- * Non-contributory pension scheme
- * Free life insurance
- * Share purchase scheme

If you are interested in working for a fast-moving and growth-orientated company with good future prospects please phone or write, giving career details, to:

Christine Bristow, Personnel Department, Hewlett Packard Limited, King Street Lane, Winnersh, Wokingham, Berkshire, Telephone: Wokingham 784774, Extension 2127.

These positions are open to men and women.



**HEWLETT
PACKARD**

COMPUTER OPERATIONS

Up to £5590

In a year that promises to be another record for Volvo in the U.K., we are looking for Computer Operators. Staff to join us within our Head Office at High Wycombe. Our new computer installation consists of two ICL 2950's which you would be responsible for running, together with associated terminal and micro computers. We operate on a 5 day, 3 shift basis. To join us you should have had previous mainframe experience, preferably with ICL 2950, 2903/4

or 1900 operating under Geogra II. We're offering salaries ranging from £5050 for an Operator to £5590 for a Shift Leader, and a first-class range of benefits, including 22 days holiday, non-contributory pension, sick pay and personal accident insurance and car purchase scheme. Please telephone for an application form, or alternatively apply in writing giving full details to: Mr. M. Rogers, Divisional Personnel Manager, Volvo Concessionaires Limited, Lancaster Road, Cresswell Industrial Estate, High Wycombe, Bucks. Tel: (0494) 33444.



VOLVO



Office Automation

Our international consultancy firm is expanding its role of advising clients on office automation. Success in this role requires more than the right technical solution. It also needs the ability to gain the confidence of client staff and to motivate and work with them to achieve the desired change.

If you are interested in the management of change and have the ability to motivate staff during major re-organisations of work methods, then we can offer you challenging opportunities. We are seeking men and women aged 25-35 with the right blend of personal skills and a high level of technical expertise in several of the following areas:

- * small office computers
- * word processing
- * computer communications
- * clerical work studies
- * facsimile and other communications media
- * computer mail
- * data capture technology

Consultancy offers the opportunity to tackle interesting human and technical problems in a varied range of environments, from major international organisations to small specialised business operations. If you would like to discuss a possible career with us, please telephone Ernest Morris or Bruce Thomson on 01-808 4040, or write giving brief but comprehensive details of career and salary to date quoting Ref. SW30/10 to the Executive Selection Division at the address below.

Coopers & Lybrand Associates Limited,
Management Consultants,
Shelley House, Noble Street, London EC2V 1DQ.

THE SALES BIT

A picture is worth 1,000 words

A WELL-ESTABLISHED saying tells us that "a picture is worth 1,000 words". In reality the truth of that statement must be a function of the particular picture or set of words.

This column usually consists of about 900 words, which may give you some measure of the literary scope of the adage.

However, it is a well-established fact that people generally remember in greater detail — and for longer periods — things they have only seen as opposed to only heard.

For instance, people typically remember faces and forget names, as opposed to the contrary.

Clearly, information which is received by way of both sight and sound must have a compounding benefit, as one has the effect of stimulating the other.

Compare, for instance, the accuracy of routing instructions for driving to an out-of-the-way spot which are received over the telephone with a drawing or map received through the post. The visual description is almost certain to be more meaningful.

Yet compare both with the interactive process of having the route explained by someone with the aid of a map. The latter process must always put over the necessary information more accurately and memorably.

This is undoubtedly true of the selling process. The benefits of using visual aids to emphasise and clarify the sales message are considerable.

Sales literature usually comes under the heading of visual aids; but to be effective it has to be specifically designed to augment the sales story and it has to be used properly.

Many brochures, leaflets and catalogues tend to take the form of technical specifications and related company and product information which, by and large, has great value after the sales call rather than during it.

If pictures are to emphasise or clarify, they must be compatible with statements, such as "This is what the product looks like". This is the kind of information the system produces.

"This graph shows the relationship between output and consumption". This is how one of our existing clients uses the product.

"This is a picture of my sales manager's mistress", and so on.

Flip charts are a useful form of visual aid, particularly when it comes to emphasising key words and statements or displaying the relationships between figures.

One should not limit their potential to those metallic tablets, well beloved of all sales meetings, which often need an IQ of 100 plus to get them up, yet can be relied upon to collapse immediately prior to the climax of the presentation.

The use of desk-top flip charts of around A4 size

often makes much more sense when dealing with very small numbers of people.

However, one factor is imperative: the data must be presented in a professional manner. Nothing reduces the impact of information more than scruffy presentation.

You don't have to be an artist, but if you can't produce neat lettering with a felt-tip, get someone else who can.

For a really key presentation, why not employ the services of a commercial artist? That can do a lot for your professional image.

One useful tip for remembering important points within a flip chart presentation. Write them in pencil in the appropriate place with sufficient intensity to be seen by the presenter but not the audience.

I have always maintained and employed a "flogging book" is a permanent source of visual aids to assist in the selling process.

The purpose is to collect items to which one can quickly refer in order to emphasise a sales point.

These include written extracts and pictures from the Press and brochures, tables of information, sample input formats and output documents, pictures of products and accessories, pictures of reference clients, price lists and sample advertisements.

I am convinced that no salesman should be without one — but be sure to keep it up to date.

The use of films and photographic slides can also be effective in exploiting the power of sight and sound. One primary advantage is the ability to demand temporarily the total attention of the client.

"Switch off the light and take the phone off the hook, we're going to have a picture show!"

However, like any other selling aid, done well they can be a disaster. Here are some basic rules:

1. Check that all the equipment has been received and works well before the event.

2. Make sure the film you are using is the one you requested — or even the correct one!

3. Make sure the cables are long enough to reach from the socket to the point of presentation and that the plugs fit!

4. Thoroughly practise the presentation in its entirety as close to the event as practical — but not too close!

5. Count the number of people in the room before you switch off the lights. You wouldn't want to lose sight of a client, would you?

TRADER

Puzzle Answer

015
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SMR Sales & Marketing Recruiters Ltd

We would like to wish a
HAPPY NEW YEAR

to all the
SALESMEN

who secured new jobs, advanced enhanced status, and received career guidance with the help of our organisation in 1979.

We also extend our best wishes for the coming year to all our clients throughout the computer industry and thank them for their continuing support in their search for EXPERIENCED and TRAINEE SALES PEOPLE and PRE-POST SALES PERSONNEL.

For those clients who have yet to secure REPLENISHMENT services, we extend our facilities for SALES, TRAINING, SALES APPOINTMENT ASSESSMENT and MARKET RESEARCH, we hope 1980 will be the year in which we do business together.

TRADER and the TEAM

Tel: 01-734 9776

A Sales and Marketing Services Company

TRAINING PROMOTION RESEARCH RECRUITMENT

ELECTRONIC ENGINEERING OPPORTUNITIES IN TELECOMMUNICATIONS

Location Huyton

Plessey is a major supplier of electronic telephone exchanges to the Post Office. The Huyton Engineering Unit undertakes many activities including the support of TXE4, which uses distributed processor control and provides a modular flexible system for director and non-director local exchanges of up to 40,000 lines.

Headquarters engineering and manufacture of TXE4 are in a modern plant at Huyton, near Liverpool, adjacent to the M62 motorway with another manufacturing plant at Chorley in Lancashire.

We are looking for qualified Electronics Engineers at all levels to join engineering teams engaged on a wide range of activities concerned with the rapid growth in electronic switching and introduction of enhanced equipment.

In particular, we would like to hear from people interested in:

SYSTEMS AND CIRCUITS ENGINEERING TEST SYSTEMS SOFTWARE ENGINEERING

For further details of these vacancies and an application form, please telephone the following number between 10 a.m. and 7 p.m. on Friday, 18th, Monday 21st or Tuesday, 22nd January — 051-480 9200, or write with details of your career, experience and qualifications to:

The Personnel Officer
Plessey Telecommunications Limited
Wilson Road
Huyton, Merseyside

PLESSEY

AIR NIUGINI

Papua New Guinea's National Airline

requires

SENIOR ANALYST/PROGRAMMER

LOCATION: Port Moresby — PNG Capital.

SALARY RANGE: K16700/18000 p.a., which equates to £5g. 10895/11530.

APPLICANTS: Should have designed and implemented at least one major system; be familiar with ICL utilities and have at least 3 years' COBOL programming. It is preferred that the applicant has tertiary qualifications and a knowledge of on-line systems.

EQUIPMENT:
ICL 2950/10 1 MB under OME
ICL 2903 48K
TP MONITOR: Telecomputing e TFS

Attractive conditions include annual return flights, free accommodation, airline concessions, assistance with removal and repatriation, liberal sick and recreation leave, medical scheme and payment of school fees within Papua New Guinea and assistance with education overseas.

Applications, detailing personal and work history will be treated in confidence and should be addressed to:

Personnel Manager
AIR NIUGINI
c/o 24 London Road
Cambridge, Surrey, England

"GROUND FLOOR" OPPORTUNITY-HAMMERSMITH

Start the New Year with a brand new installation.

IBM 4331 running under DOS/VSE and VSE/POWER utilising CICS/VS and DLI. to be delivered within the next two weeks.

We therefore URGENTLY require the following people:

PROGRAMMER/ANALYST
£6,000-£7,000

To be involved in the development and programming of numerous commercial applications

OPERATIONS SUPERVISOR
£5,500-£6,500

To operate and control the operations of the new hardware, and existing bureau work.

Requirements for both of the above:

- 4 years' relevant experience.
- Knowledge of DOS/VS JCL and Celogues procedures.
- Exposure to CICS/VS and DLI desirable.
- Experience of IBM Program Development Methodology for the Programmer/Analyst position, and Supervisory experience for the Operations position would also be advantageous.

Other benefits for both those positions include:

- 45p per day LVs.
- Flexible working hours.
- Free Life Assurance and Contracted-out Contributory Pension Fund.
- Annual season ticket loans for one year's service.

Linguaphone

Application forms and job descriptions may be obtained from:

Personnel Department, Linguaphone Institute Limited,
Linguaphone House, Beaver Lane, Hammersmith,
London W6 9AR
Tel: 01-741 1655, ext. 262

NALGO

As a result of internal re-organisation and promotions, we require the following staff:

(1) OPERATIONS MANAGER
- £7386 to £8061 p.a. incl.

Applicants should have a thorough knowledge of J.C.L. (or GII) and an appreciation of Date Control Techniques. The post could suit a Shift Leader seeking a first experience of management.

(2) PROGRAMMERS - £8840 to £7752 p.a. incl.

Minimum of 1 1/2 years' experience of ICL COBOL.

The Association has a 48K ICL 2804 to be upgraded to 64K with EOS 60s Mag. Tapes and DOE input. A review of all current systems (which include Financial, Insurance and Building Society applications) has identified the need for major re-systemisation. Future developments will include a communications system.

BENEFITS INCLUDE: 17 1/2% rebate on mortgage interest; 26 days' annual leave; 13 days' public holiday; interest-free season-ticket loans; subsidised staff restaurant and modern working environment; active sports and social club; removal and disturbance allowances.

Further information ring: Alan Cowdall (x 364) or John Faithfull (x 380) on 01-388 2366 or write for application forms and details to: The General Secretary, National and Local Government Officers' Association, 1 Mabledon Place, London WC1H 8AJ.

Closing date for receipt of applications is January 31, 1980.

PRODUCT MANAGER FOR ARRAY PROCESSOR

Analogic Limited is looking for a Product Manager to handle its new AP400 Array Processor which is finding wide applications in medical imaging, including computer assisted tomography systems, seismic research and energy exploration, satellite communications, etc.

The right candidate for this position will be qualified to at least honours degree, and preferably PhD standard, with experience in computer hardware of most of the leading micro and mini computer manufacturers, and at the same time be an expert in software applications.

The job will consist of marketing and promotion of the Array Processor in the U.K. and giving full technical support to the distributors and subsidiaries throughout Europe, working in conjunction with the International Sales Manager.

The position carries a salary of £15,000 p.a. plus a 2-litre company car, four weeks' holiday, pension scheme, full travelling expenses, etc.

Write or telephone for an interview to:

L. E. Mason, General Manager
ANALOGIC LIMITED
The Centre, 68 High Street, Weybridge, Surrey KT13 8BN
Tel. Weybridge 41215

EUROCOM COM-GROW WITH US

EUROCOM is UK BASED and the LARGEST LEADING C.O.M. (Computer Output to Micro-film) Service Company operating 18 BUREAUX IN EUROPE, 9 IN THE UK plus a further 9 in Sweden, Germany, Denmark and Finland.

The Use of COM TECHNOLOGY IS INCREASING AT 30% P.A. As a market leader EUROCOM'S 40% growth in recent years is forecast to continue well into the 80's.

All posts carry excellent banking fringe benefits. To continue this growth rate we require:

SALES EXECUTIVES
LONDON, LEEDS, BIRMINGHAM, CARDIFF, RICKMANSWORTH

Experienced Bureau sales staff can expect to earn £8-10,000 (high basic + commission) + marketing COM and microfilm viewing equipment.

ALSO we would be pleased to hear from Systems personnel from computer or business background who wish to move into selling, or business equipment sales staff anxious to keep pace with advancing technology.

SALES SUPPORT SYSTEMS STAFF
LONDON, LEEDS, RICKMANSWORTH

Programmers/Analysts with at least 1-2 years' mainframe experience are required to support growth and involvement with all types of computer systems especially the use of COM in conjunction with real time systems. Salary on a scale rising to £6,500 with excellent growth potential.

Please write or telephone to:

Ian Woolcott
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HERTFORDSHIRE COUNTY COUNCIL
HIGHWAYS DEPARTMENT

SENIOR ANALYST

SALARY £8827-£7008 + £189 FRINGE
GRADE PO1 (E/F) POST NO. SE45

The Job

We offer you the opportunity to join the Highways Computer Unit where you will be able to develop and support a wide variety of engineering and management information systems.

You will be responsible for the control of development projects from feasibility through to implementation with the assistance of a small team whose work you will plan and direct.

Existing applications for which the team is responsible are Road and Bridge Design, PERT and Staff Costing, Street Lighting Inventory and Financial Control and Transportation Modelling.

The present County Council computer is an NCR Criterion 8580 with 1 Megabyte of Memory operating under VRX. Access from Highways department is via Courier Service and a single terminal. The department also makes considerable use of computer bureaux via a remote batch terminal and a number of interactive terminals.

In June, 1980, the Highways department is to take delivery of a PRIME 350 mini computer which will be linked to the County Council Computer and a computer bureau add which will service a network of terminals within the site at Goldings, performing a wide range of activities, also connected to the PRIME will be a new online drum plotter.

New projects for the team include the development of a new PERT system including Target Design Costing and new Transportation Modelling facilities as well as providing technical support for the department's impending use of MOSS.

The Person

You should have a degree in Civil Engineering, Applied Mathematics or Computing and extensive experience in technical computing with a background in COBOL and FORTRAN programming.

Please telephone or write for application forms and further details to Deborah Martindeale, Highways Department, Goldings, North Road, Hatfield SG14 2PY. Telephone Hatfield 64242 Extension 8020

Closing date: February 8, 1980.

COMPUTER SYSTEMS SPECIALIST

Worley Engineering, one of the largest employers in Wood Green, require a Computer Systems Specialist for their new air conditioned offices on posite Wood Green underground.

Applicants should be competent computer programmers or experienced EDP clerks who would like to learn higher level computer application languages. Work will involve engineering application program maintenance and use. Knowledge of Fortran and/or time share systems would be useful but not essential.

Good negotiable salary and benefits. For further details please contact Rosa Gunson, Personnel Assistant.

WORLEY

Worley Engineering Limited, Surrey House, 222 High Road, Wood Green, London N22. Telephone: 01-405 3171.

SHIPLEY EUROPE LIMITED

The controlling Company of the European Group of Shipley Companies, being major suppliers of specialised chemical processes to the printed circuit, micro electronics and plating on plastics industries invite applications for the position of:

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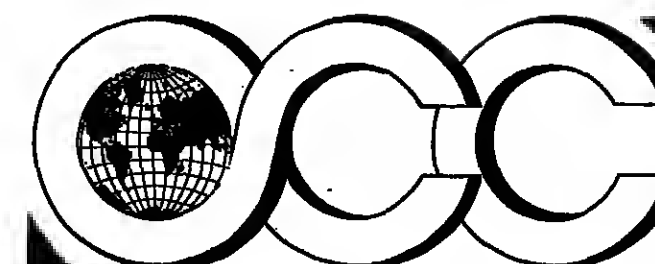
Reporting to the Group Financial Director, the successful applicant will have a wide knowledge and experience in systems analysis and programming within a commercial environment. Will have a proven ability to design, programme and implement major systems and maintain existing applications without supervision.

Support is provided through a small well-experienced staff who will call for their continued career development through the D.P. Manager and his knowledge and experience. The Coventry mainframe is an I.B.M. System 34; supported by I.B.M. 3741 Key to Oikette application in certain European locations.

To take this responsibility, the successful applicant will have a mature attitude and the ability to formulate and present in return the Company offers an interesting and rewarding career whilst providing a competitive salary coupled to an attractive fringe benefit programme.

Applicants (held in strict confidence) should be in writing and should include a detailed curriculum vitae. Alternatively, in the first instance for an informal discussion please telephone:

The Personnel Manager
Shipley Europe Limited
Humber Avenue
Coventry CV3 1JL
Telephone: Coventry 457203

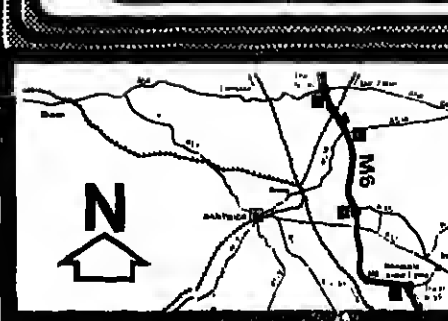


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Call in and talk to us about your career. You don't have to be actually looking for a new job - or even thinking about a change.

OCC professional career counselling will give a frank, unbiased assessment of your future expectations and perhaps suggest some new avenues worth consideration. Our purpose is NOT to try to persuade you to change your job, but to help you get your career path into sharper perspective, enabling future decisions to be made confidently, with positive goals in sight which match your abilities and needs.

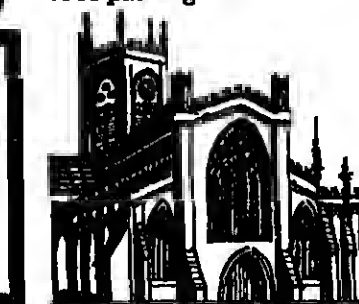
Of course, if you are looking for a new job, we have many vacancies on file, some of which are listed below.

You can also make it an enjoyable family day out in popular Nantwich, an ancient Cheshire market town with many fine speciality shops and historic buildings. Saturday is Market Day! Free parking.

CAREER COUNSELLING

10.00am to 4.30pm
- just call in on the above date.

If you wish to make a definite appointment - please ring 0270 627 206



OCC Computer Personnel, 4 Church Lane, Nantwich, Cheshire CW5 5RQ (Just by the Church)

PROGRAMMERS			OVERSEAS		
Alderley Edge	2-3 years. RPG, COBOL, PLI, ASS, FORTRAN	to £6,000	Toronto	IBM, COBOL Programmers	\$21,000
Manchester	Mobile, well educated, any experience	to \$5,650	Saudi Arabia	IBM, PLI, COBOL, FORTRAN	to \$15,000
Willeslow	IBM, CICS, DLI, IMS	to £7,000	Saudi Arabia	Maintenance Engineers; Mfals	to \$15,500
Chester	ICL COBOL, Friendly atmosphere	to £5,500	Germany	Basic software; Communications	to \$15,000
St. Helens	2 yrs. IBM COBOL	to £5,500	Kuwait	IBM, COBOL; DOS/VS; OS; CICS	to \$15,000 + accom.
Staffs.	Micro software development	to £8,000	Holland	Realtime software; minis; micros; communications; operating systems; process control; telemetry	to \$15,000
Liverpool	2 yrs. COBOL, Degree preferred	to £6,000	Switzerland		
Leeds	PDP11 Software prog. Exp. on any minicom. req.	(Negotiable)	Belgium		
			Brussels	MVS systems Programmer	c. £14,000
ANALYSTS			I cannot come to see you, but I am interested in the following job		
Wythenshawe	2 yrs. systems experience; IBM preferred	to £6,000	Name		
Leeds	Varied applications; range of vacancies	to £7,500	Address		
Chester	2 yrs. experience; advanced applications	to £6,400	Tel Home		
St. Helens	2 yrs. systems experience; IBM preferred	to £7,000	Work		
			Simply complete the coupon, send it to us. We'll be in touch.		
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			Tel 0270 627 206		

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Digital Equipment, world leaders in the manufacture and distribution of mini-computers, require Senior Analyst/Programmers and Analyst/Programmers to develop Commercial Application Systems which will be used by Digital throughout Europe.

Successful applicants for the Senior posts will have several years experience in the commercial field and be capable of assuming the responsibility to lead a development team in all phases of a project from Computer Systems Design to Installation of the system.

Experience in a wide range of commercial application systems would be an advantage.

Successful applicants for the Analyst/Programmer positions will be experienced in design and development of application systems and be capable of working in an independent manner.

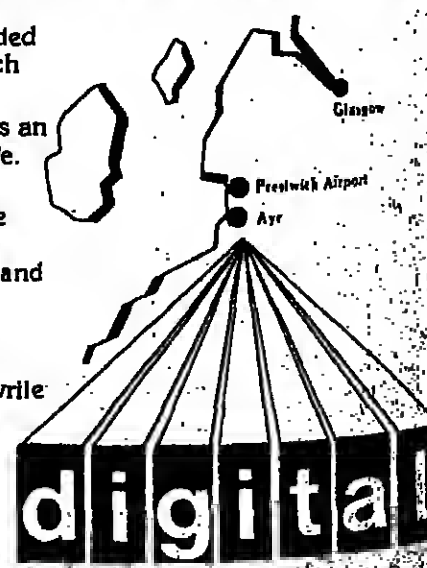
Where necessary, training will be provided in the languages and the hardware which will be used.

We offer highly competitive salaries plus an attractive benefits and relocation package.

Our modern, multi-million pound, manufacturing facility is situated outside Ayr, an attractive coastal resort offering excellent housing, medical, educational and social facilities and a wide range of recreational pursuits.

If you are interested in these career opportunities at Digital then phone or write to:

Dennis MacRae,
Digital Equipment Scotland Limited,
Moasthill, Ayr.
Tel: Ayr 66955.



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COMMERCIAL ANALYST

We have vacancies in our head office in Cardiff for two experienced Commercial Analysts to assist in the development and implementation of local and Group-based systems. The Company will shortly be installing a Univac V Series computer linked to a Univac 1110 mainframe.

Applicants should be educated to degree level and should have at least 5 years' data processing experience, preferably in a financial environment. A practical knowledge of management information systems is essential.

The position will involve some travelling to locations in Wales and the south-west of England.

There are excellent opportunities for career development within the Bass group. We offer a competitive salary, company car, contributory Pension and Life Assurance Scheme, plus other benefits associated with a major company.

Applications in writing, stating age, experience and present salary to:

J. W. McCullough
Personnel Manager
BASS WALES & WEST LIMITED
Muss-y-Coed Road
P.O. Box 118 NDO
Cardiff CF4 4UW

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